US012076009B2

(12) **United States Patent**
Maddur et al.

(10) **Patent No.: US 12,076,009 B2**
(45) **Date of Patent: Sep. 3, 2024**

(54) **TISSUE GUIDE FOR CURVED END EFFECTORS**

(71) Applicant: **Covidien LP**, Mansfield, MA (US)

(72) Inventors: **Jeevan Shankar Setty Maddur**, Bangalore (IN); **Shaohui Shi**, Shanghai (CN); **Sridharan Varadhan**, Hyderabad (IN); **Xini Zhang**, Shanghai (CN); **Syed Sarfraz Ahamed**, Shanghai (CN); **Manojit Hazra**, Hyderabad (IN)

(73) Assignee: **Covidien LP**, Mansfield, MA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 97 days.

(21) Appl. No.: **17/797,196**

(22) PCT Filed: **Feb. 3, 2020**

(86) PCT No.: **PCT/CN2020/074175**
§ 371 (c)(1),
(2) Date: **Aug. 3, 2022**

(87) PCT Pub. No.: **WO2021/155483**
PCT Pub. Date: **Aug. 12, 2021**

(65) **Prior Publication Data**

US 2023/0052972 A1 Feb. 16, 2023

(51) **Int. Cl.**
A61B 17/072 (2006.01)

(52) **U.S. Cl.**
CPC .. ***A61B 17/072*** (2013.01); *A61B 2017/07221* (2013.01); *A61B 2017/07257* (2013.01)

(58) **Field of Classification Search**
CPC ... A61B 17/072; A61B 17/105; A61B 17/115; A61B 17/1157; A61B 2017/07221;
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,158,111 A 10/1915 Ahlheim
2,891,250 A 6/1959 Hirata
(Continued)

FOREIGN PATENT DOCUMENTS

CN 106923874 A * 7/2017 ..... A61B 17/072
CN 107106169 A 8/2017
(Continued)

OTHER PUBLICATIONS

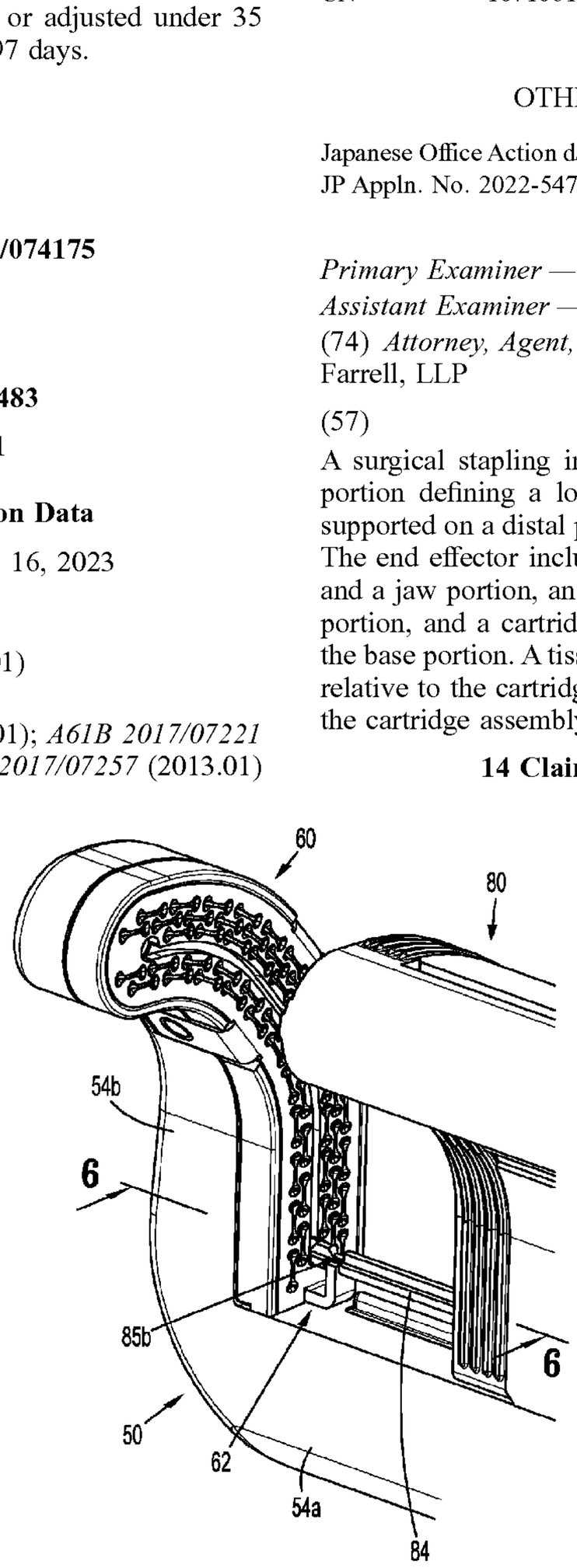
Japanese Office Action dated Oct. 24, 2023, issued in corresponding JP Appln. No. 2022-547073, 7 pages.
(Continued)

Primary Examiner — Stephen F. Gerrity
Assistant Examiner — Linda J Hodge
(74) *Attorney, Agent, or Firm* — Carter, DeLuca & Farrell, LLP

(57) **ABSTRACT**

A surgical stapling instrument includes an elongate body portion defining a longitudinal axis, and an end effector supported on a distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, and a cartridge assembly releasably supported on the base portion. A tissue guide member is operably secured relative to the cartridge assembly to facilitate alignment of the cartridge assembly through a firing stroke.

14 Claims, 21 Drawing Sheets



(58) **Field of Classification Search**
CPC A61B 2017/07257; A61B 2017/07271; A61B 2017/07228; A61B 2017/07214
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,080,564	A		3/1963	Strekopitov et al.	
3,252,643	A		5/1966	Strekopov et al.	
3,269,630	A		8/1966	Fleischer	
3,275,211	A		9/1966	Hirsch et al.	
3,315,863	A		4/1967	O'Dea	
3,494,533	A		2/1970	Green et al.	
3,589,589	A		6/1971	Akopov	
3,692,224	A		9/1972	Astafiev et al.	
3,795,034	A		3/1974	Strekopytov et al.	
3,822,818	A		7/1974	Strekopytov et al.	
3,935,981	A		2/1976	Akopov et al.	
3,949,923	A		4/1976	Akopov et al.	
4,047,654	A		9/1977	Alvarado	
4,216,891	A		8/1980	Behlke	
4,244,372	A		1/1981	Kapitanov et al.	
4,272,002	A	*	6/1981	Moshofsky	A61B 17/072 227/135
4,273,281	A	*	6/1981	Smith	A61B 17/072 227/152
4,296,881	A		10/1981	Lee	
4,305,539	A		12/1981	Korolkov et al.	
4,354,628	A		10/1982	Green	
4,378,901	A		4/1983	Akopov et al.	
4,383,634	A		5/1983	Green	
4,402,444	A		9/1983	Green	
4,415,112	A		11/1983	Green	
D273,513	S		4/1984	Spreckelmeier	
4,442,964	A		4/1984	Becht	
4,470,533	A		9/1984	Schuler	
4,475,679	A		10/1984	Fleury, Jr.	
4,485,811	A		12/1984	Chernousov et al.	
4,506,670	A		3/1985	Crossley	
4,506,671	A		3/1985	Green	
4,508,253	A		4/1985	Green	
4,522,327	A		6/1985	Korthoff et al.	
4,527,724	A		7/1985	Chow et al.	
4,530,453	A		7/1985	Green	
4,550,870	A		11/1985	Krumme et al.	
4,566,620	A		1/1986	Green et al.	
4,568,009	A		2/1986	Green	
4,573,622	A		3/1986	Green et al.	
4,580,712	A		4/1986	Green	
4,585,153	A		4/1986	Failla et al.	
4,589,582	A		5/1986	Bilotti	
4,602,634	A		7/1986	Barkley	
4,605,001	A		8/1986	Rothfuss et al.	
4,605,004	A		8/1986	Di Giovanni et al.	
4,606,344	A		8/1986	Di Giovanni	
4,606,345	A		8/1986	Dorband et al.	
4,607,636	A		8/1986	Kula et al.	
4,612,933	A		9/1986	Brinkerhoff et al.	
4,617,928	A		10/1986	Alfranca	
4,632,290	A		12/1986	Green et al.	
4,665,916	A	*	5/1987	Green	A61B 17/072 227/19
4,684,051	A		8/1987	Akopov et al.	
4,714,187	A		12/1987	Green	
4,715,520	A		12/1987	Roehr, Jr. et al.	
4,728,020	A		3/1988	Green et al.	
4,767,044	A		8/1988	Green	
4,788,978	A		12/1988	Strekopytov et al.	
4,802,614	A		2/1989	Green et al.	
4,805,823	A		2/1989	Rothfuss	
4,819,853	A		4/1989	Green	
4,848,637	A		7/1989	Pruitt	
4,869,414	A		9/1989	Green et al.	
4,881,544	A		11/1989	Green et al.	
4,881,545	A		11/1989	Isaacs et al.	
4,915,100	A		4/1990	Green	
4,930,503	A		6/1990	Pruitt	
4,938,408	A		7/1990	Bedi et al.	
4,941,623	A		7/1990	Pruitt	
4,951,861	A		8/1990	Schulze et al.	
4,964,559	A		10/1990	Deniega et al.	
5,005,754	A		4/1991	Van Overloop	
5,018,657	A		5/1991	Pedlick et al.	
5,071,052	A		12/1991	Rodak et al.	
5,100,042	A		3/1992	Gravener et al.	
5,116,349	A		5/1992	Aranyi	
5,137,198	A		8/1992	Nobis et al.	
5,172,845	A		12/1992	Tejeiro	
5,190,203	A		3/1993	Rodak	
5,219,111	A		6/1993	Bilotti et al.	
5,240,163	A		8/1993	Stein et al.	
5,344,060	A		9/1994	Gravener et al.	
5,368,599	A		11/1994	Hirsch et al.	
5,405,073	A		4/1995	Porter	
5,413,267	A		5/1995	Solyntjes et al.	
5,439,155	A		8/1995	Viola	
5,452,836	A		9/1995	Huitema et al.	
5,458,279	A		10/1995	Plyley	
5,462,215	A		10/1995	Viola et al.	
5,464,144	A		11/1995	Guy et al.	
5,465,894	A		11/1995	Clark et al.	
5,470,006	A		11/1995	Rodak	
5,470,008	A		11/1995	Rodak	
5,470,009	A		11/1995	Rodak	
5,497,934	A		3/1996	Brady et al.	
5,503,320	A		4/1996	Webster et al.	
5,509,596	A		4/1996	Green et al.	
5,542,594	A		8/1996	Mckean et al.	
5,547,117	A		8/1996	Hamblin et al.	
5,558,266	A		9/1996	Green et al.	
5,571,285	A		11/1996	Chow et al.	
5,579,978	A		12/1996	Green et al.	
5,580,067	A		12/1996	Hamblin et al.	
5,603,443	A		2/1997	Clark et al.	
5,605,272	A		2/1997	Witt et al.	
5,605,273	A		2/1997	Hamblin et al.	
5,607,094	A		3/1997	Clark et al.	
5,615,820	A		4/1997	Viola	
5,641,111	A		6/1997	Ahrens et al.	
5,678,748	A		10/1997	Plyley et al.	
5,697,543	A		12/1997	Burdorff	
5,706,997	A		1/1998	Green et al.	
5,706,998	A		1/1998	Plyley et al.	
5,732,871	A		3/1998	Clark et al.	
5,735,445	A		4/1998	Vidal et al.	
5,794,834	A		8/1998	Hamblin et al.	
5,810,240	A		9/1998	Robertson	
5,855,311	A		1/1999	Hamblin et al.	
5,878,937	A		3/1999	Green et al.	
5,893,506	A		4/1999	Powell	
5,894,979	A		4/1999	Powell	
5,964,394	A		10/1999	Robertson	
6,045,560	A		4/2000	McKean et al.	
6,638,285	B2		10/2003	Gabbay	
6,805,273	B2		10/2004	Bilotti et al.	
6,817,508	B1		11/2004	Racenet et al.	
6,988,650	B2		1/2006	Schwemberger et al.	
7,070,083	B2		7/2006	Jankowski	
7,134,587	B2		11/2006	Schwemberger et al.	
7,147,139	B2		12/2006	Schwemberger et al.	
7,147,140	B2		12/2006	Wukusick et al.	
7,204,404	B2		4/2007	Nguyen et al.	
7,207,472	B2		4/2007	Wukusick et al.	
7,210,609	B2		5/2007	Leiboff et al.	
7,237,708	B1		7/2007	Guy et al.	
7,275,674	B2		10/2007	Racenet et al.	
RE40,237	E		4/2008	Bilotti et al.	
7,407,076	B2		8/2008	Racenet et al.	
7,431,190	B2		10/2008	Hoffman	
7,522,854	B2		4/2009	Kinouchi et al.	
7,549,563	B2		6/2009	Mather et al.	
7,568,605	B2		8/2009	Kruszynski	
7,641,092	B2		1/2010	Kruszynski et al.	
7,717,312	B2		5/2010	Beetel	
7,731,073	B2		6/2010	Wixey et al.	

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,735,704	B2	6/2010	Bilotti	
7,766,207	B2	8/2010	Mather et al.	
7,810,690	B2	10/2010	Bilotti et al.	
7,828,188	B2	11/2010	Jankowski	
7,886,953	B2	2/2011	Schwemberger et al.	
8,016,176	B2	9/2011	Kasvikis et al.	
8,029,520	B2	10/2011	Korvick et al.	
8,033,439	B2	10/2011	Racenet et al.	
8,070,038	B2	12/2011	Kostrzewski	
8,231,041	B2	7/2012	Marczyk et al.	
8,292,904	B2	10/2012	Popovic et al.	
8,328,064	B2	12/2012	Racenet et al.	
8,360,296	B2	1/2013	Zingman	
8,424,738	B2	4/2013	Kasvikis	
8,499,994	B2	8/2013	D'Arcangelo	
8,596,515	B2	12/2013	Okoniewski	
8,627,994	B2	1/2014	Zemlok et al.	
8,646,673	B2	2/2014	Bilotti et al.	
8,757,467	B2	6/2014	Racenet et al.	
8,936,185	B2	1/2015	Racenet et al.	
8,955,732	B2	2/2015	Zemlok et al.	
8,967,446	B2	3/2015	Beardsley et al.	
9,022,273	B1	5/2015	Marczyk et al.	
9,125,651	B2	9/2015	Mandakolathur Vasudevan et al.	
9,192,382	B2	11/2015	Kostrzewski	
9,192,387	B1	11/2015	Holsten et al.	
9,480,474	B2	11/2016	Ji et al.	
9,566,066	B2	2/2017	Kasvikis	
9,579,102	B2	2/2017	Holsten et al.	
9,655,619	B2	5/2017	Zhang et al.	
9,662,111	B2	5/2017	Holsten et al.	
9,668,736	B2	6/2017	Holsten et al.	
9,675,349	B2	6/2017	Holsten et al.	
9,675,350	B2	6/2017	Holsten et al.	
9,675,356	B2	6/2017	Racenet et al.	
9,814,460	B2	11/2017	Kimsey et al.	
9,888,923	B2	2/2018	Chen et al.	
9,962,159	B2	5/2018	Heinrich et al.	
10,004,504	B2	6/2018	Bryant	
10,085,754	B2	10/2018	Sniffin et al.	
10,194,913	B2	2/2019	Nalagatla et al.	
2004/0164123	A1	8/2004	Racenet et al.	
2005/0145672	A1*	7/2005	Schwemberger	A61B 17/072 227/176.1
2005/0247752	A1	11/2005	Kelly et al.	
2005/0247753	A1	11/2005	Kelly et al.	
2006/0163312	A1	7/2006	Viola et al.	
2006/0201992	A1	9/2006	Racenet et al.	
2007/0187456	A1	8/2007	Viola et al.	
2008/0093415	A1*	4/2008	Bilotti	A61B 17/072 227/180.1
2009/0302093	A1*	12/2009	Kasvikis	A61B 17/29 227/176.1
2010/0048988	A1	2/2010	Pastorelli et al.	
2013/0206813	A1	8/2013	Nalagatla	
2016/0249914	A1	9/2016	Zhang et al.	
2016/0249923	A1	9/2016	Hodgkinson et al.	
2016/0270784	A1	9/2016	Wheeler et al.	
2016/0270790	A1	9/2016	Jankowski	
2016/0270793	A1	9/2016	Carter et al.	
2016/0278779	A1	9/2016	Jankowski	
2017/0014134	A1	1/2017	Chen et al.	
2017/0027571	A1	2/2017	Nalagatla et al.	
2017/0027572	A1	2/2017	Nalagatla et al.	
2017/0027573	A1	2/2017	Nalagatla et al.	
2017/0027574	A1	2/2017	Nalagatla et al.	
2017/0128149	A1	5/2017	Heinrich et al.	
2017/0189022	A1	7/2017	Adams et al.	
2017/0238923	A1	8/2017	Holsten et al.	
2017/0238924	A1	8/2017	Holsten et al.	
2017/0265861	A1	9/2017	Holsten et al.	
2018/0008261	A1	1/2018	Racenet et al.	
2018/0049739	A1	2/2018	Kasvikis	
2018/0153544	A1*	6/2018	Maddur Shankarsetty	A61B 90/90
2018/0221024	A1	8/2018	Heinrich et al.	

FOREIGN PATENT DOCUMENTS

CN	108024810	A	5/2018	
CN	108472039	A	8/2018	
CN	108472040	A	8/2018	
EP	666057	A2 *	8/1995	A61B 17/072
EP	3187128	A1 *	7/2017	A61B 17/0686
EP	3329862	A2	6/2018	
JP	2005193034	A	7/2005	
JP	2010259792	A	11/2010	

OTHER PUBLICATIONS

International Search Report and Written Opinion dated Oct. 28, 2020, issued in corresponding international application No. PCT/CN2020/074175, 12 pages.

Extended European Search Report dated Dec. 19, 2023, issued in corresponding EP Application No. 20917522, 8 pages.

* cited by examiner

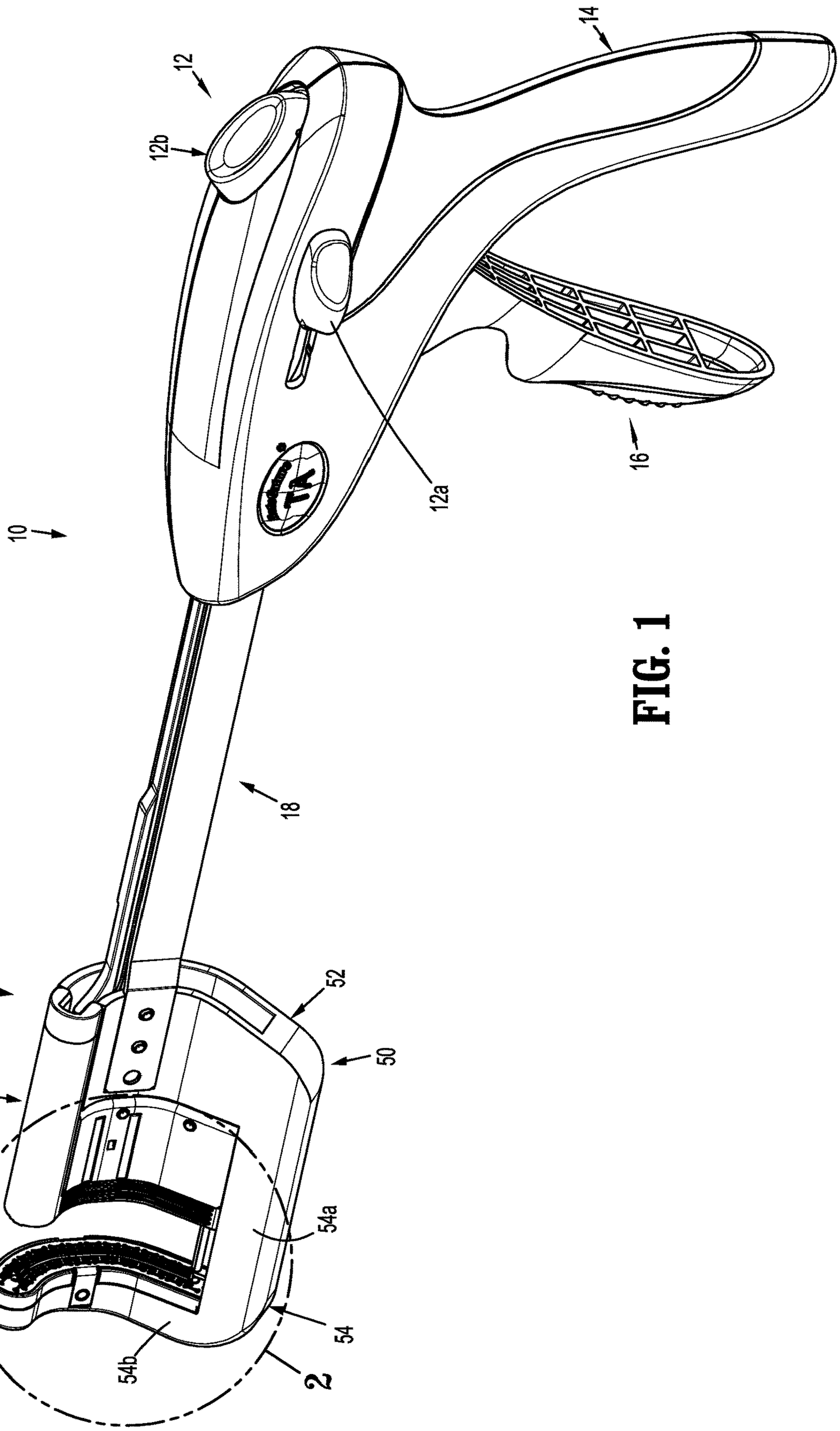


FIG. 1

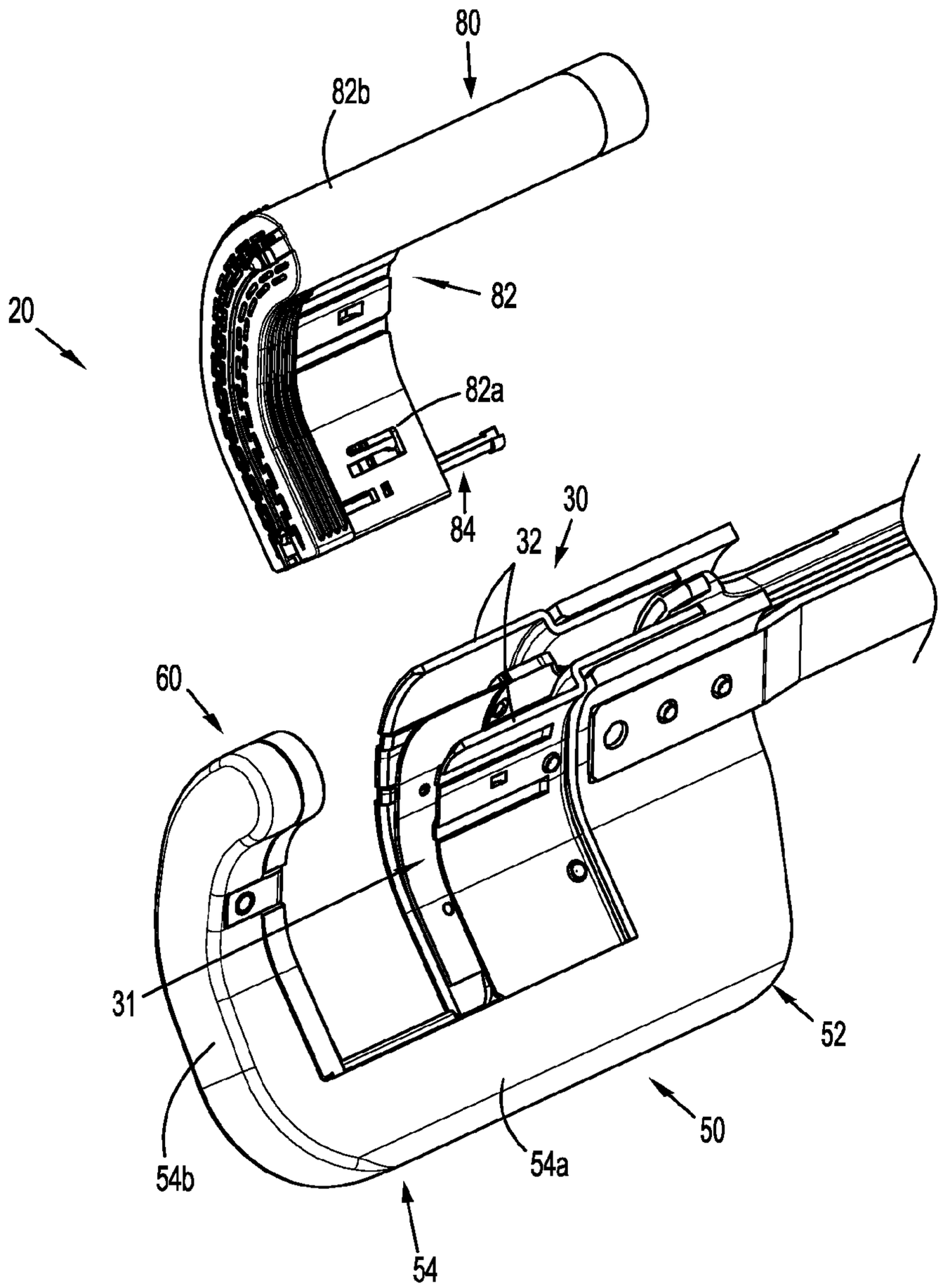


FIG. 2

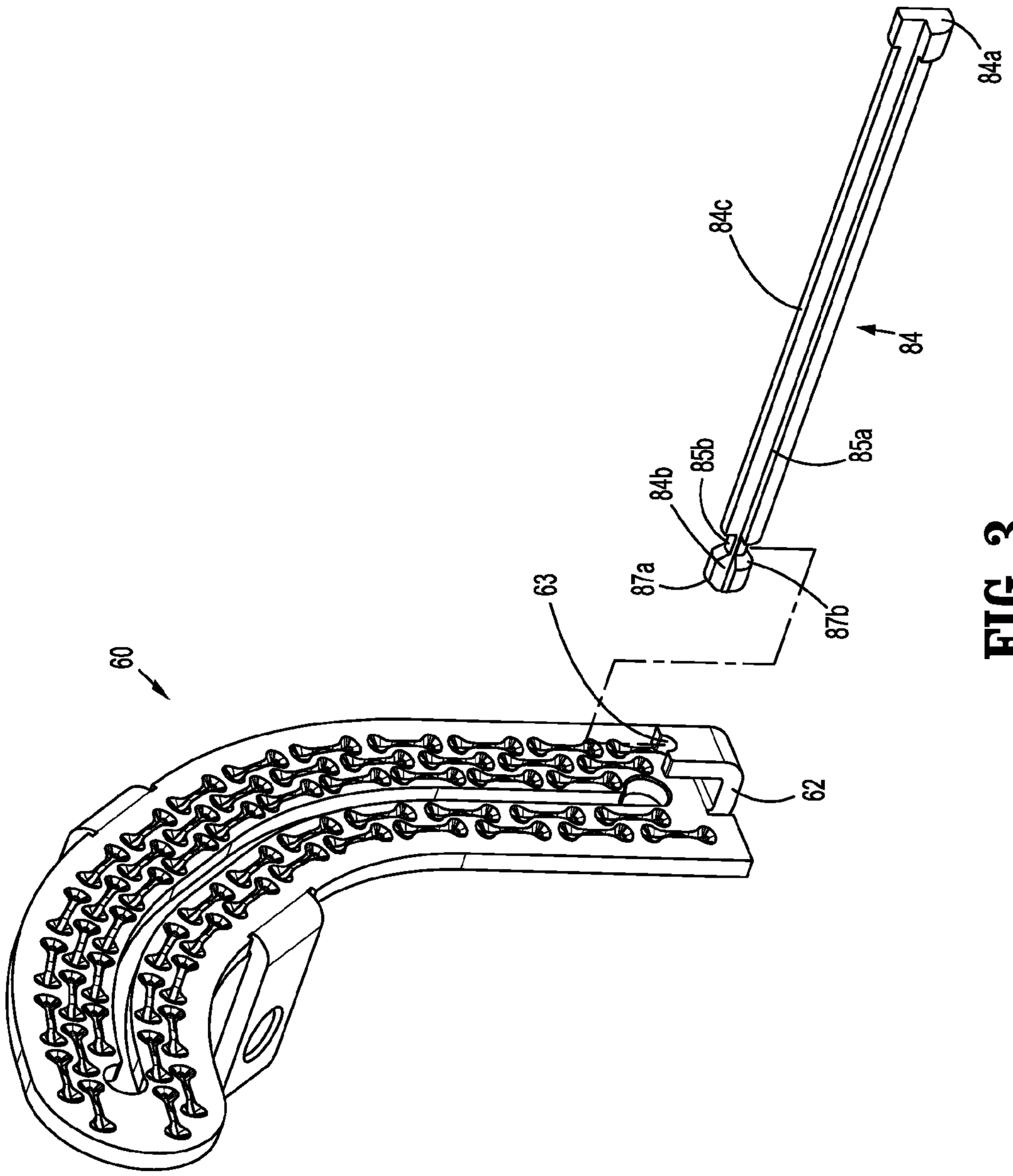


FIG. 3

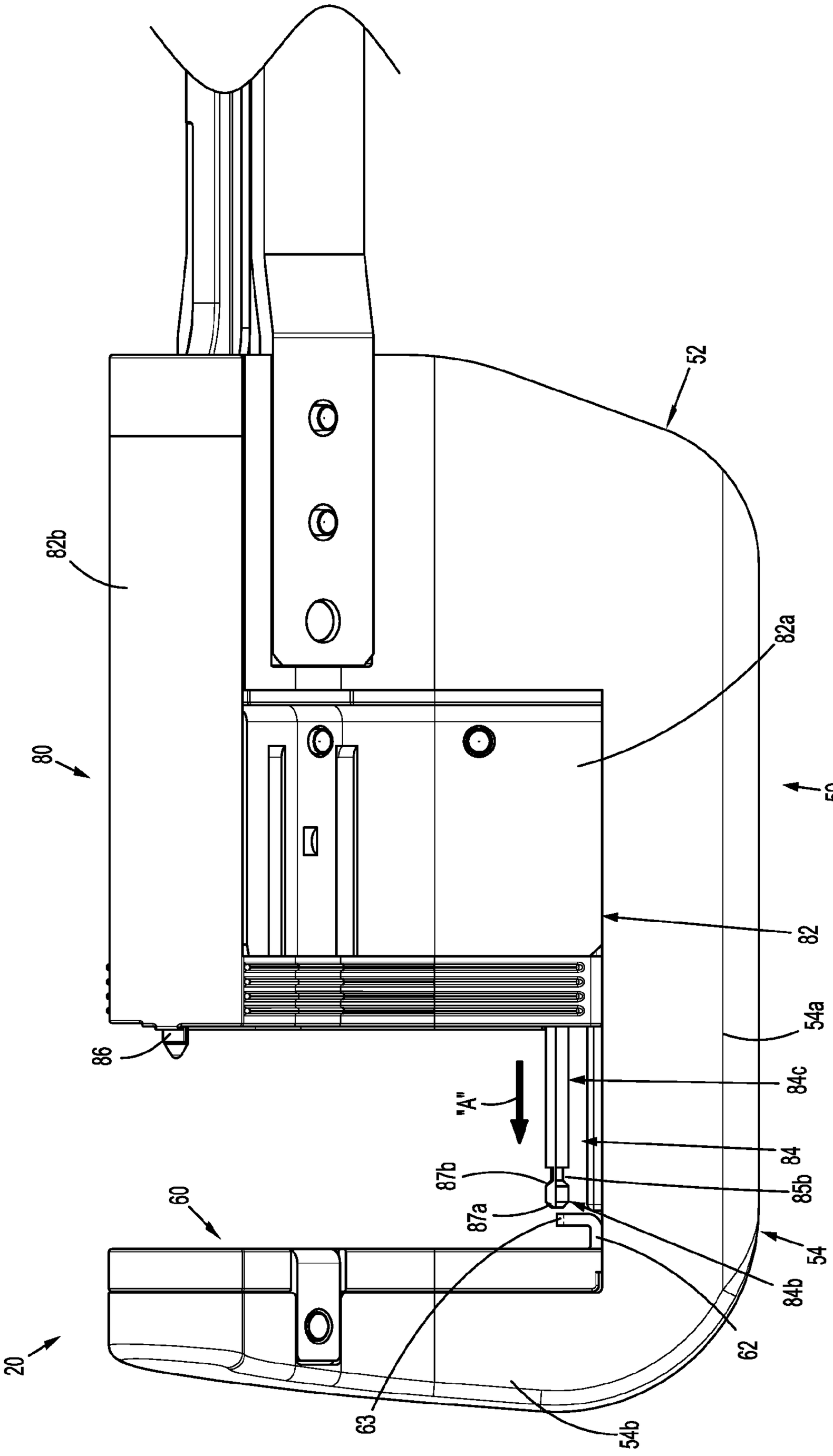

52
82b
80
82a
82
50
54a
86
"A"
84c
84
87b
85b
87a
60
54
84b
62
20
63
54b

FIG. 4

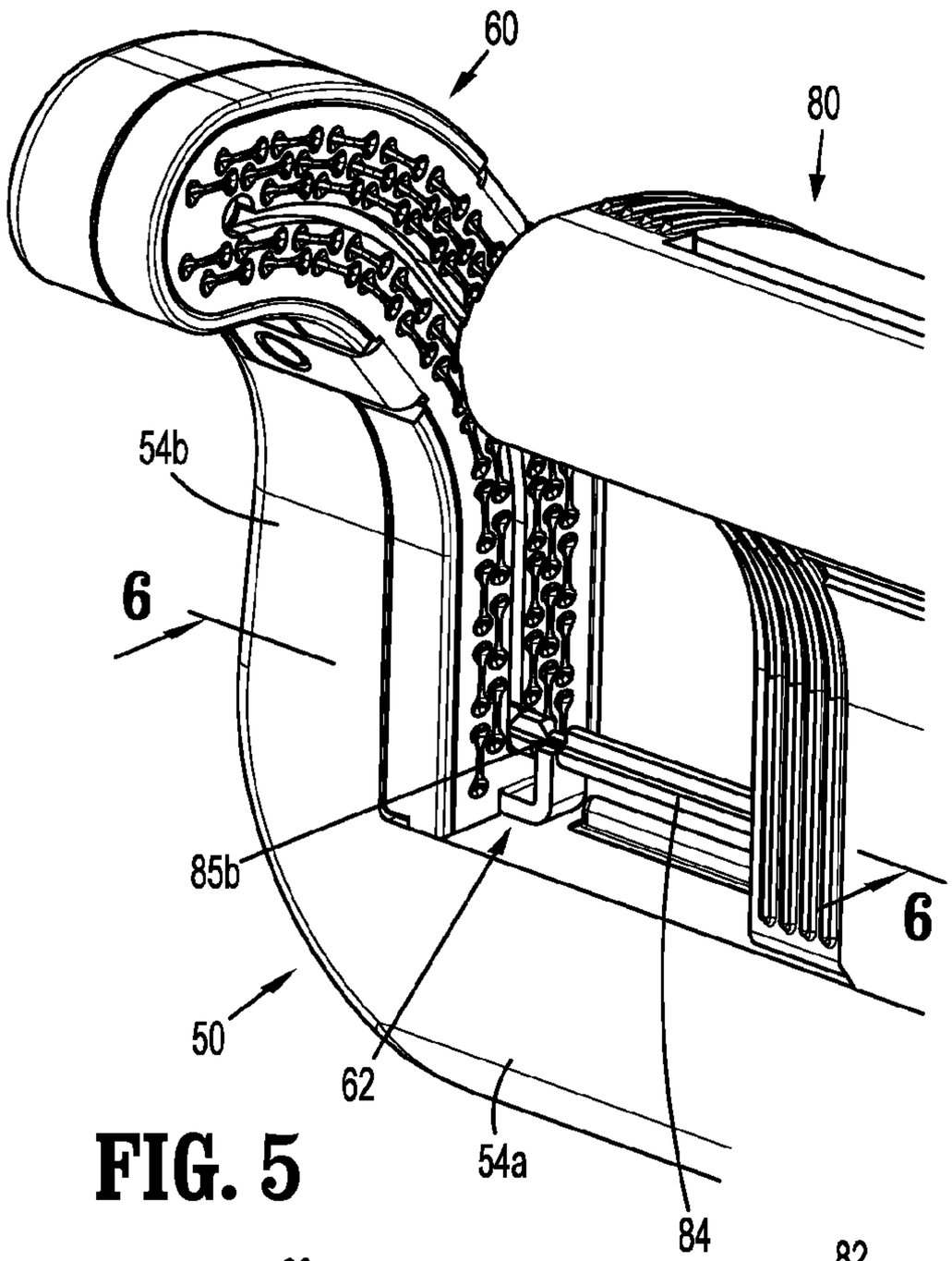

60
80
54b
6
85b
6
50
62
54a
84

FIG. 5

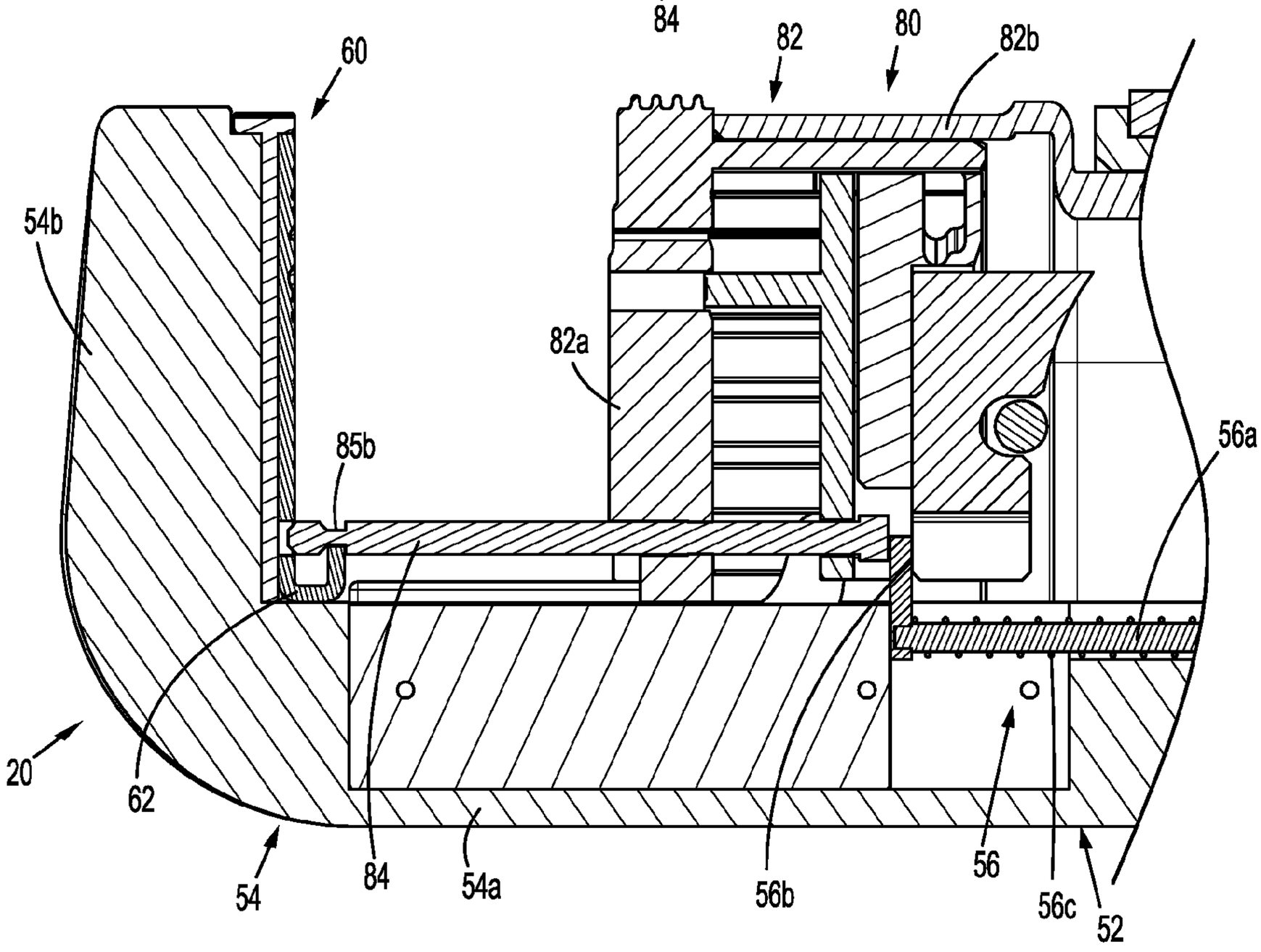

60
82
80
82b
54b
82a
85b
56a
20
62
84
54a
56b
56
56c
52
54

FIG. 6

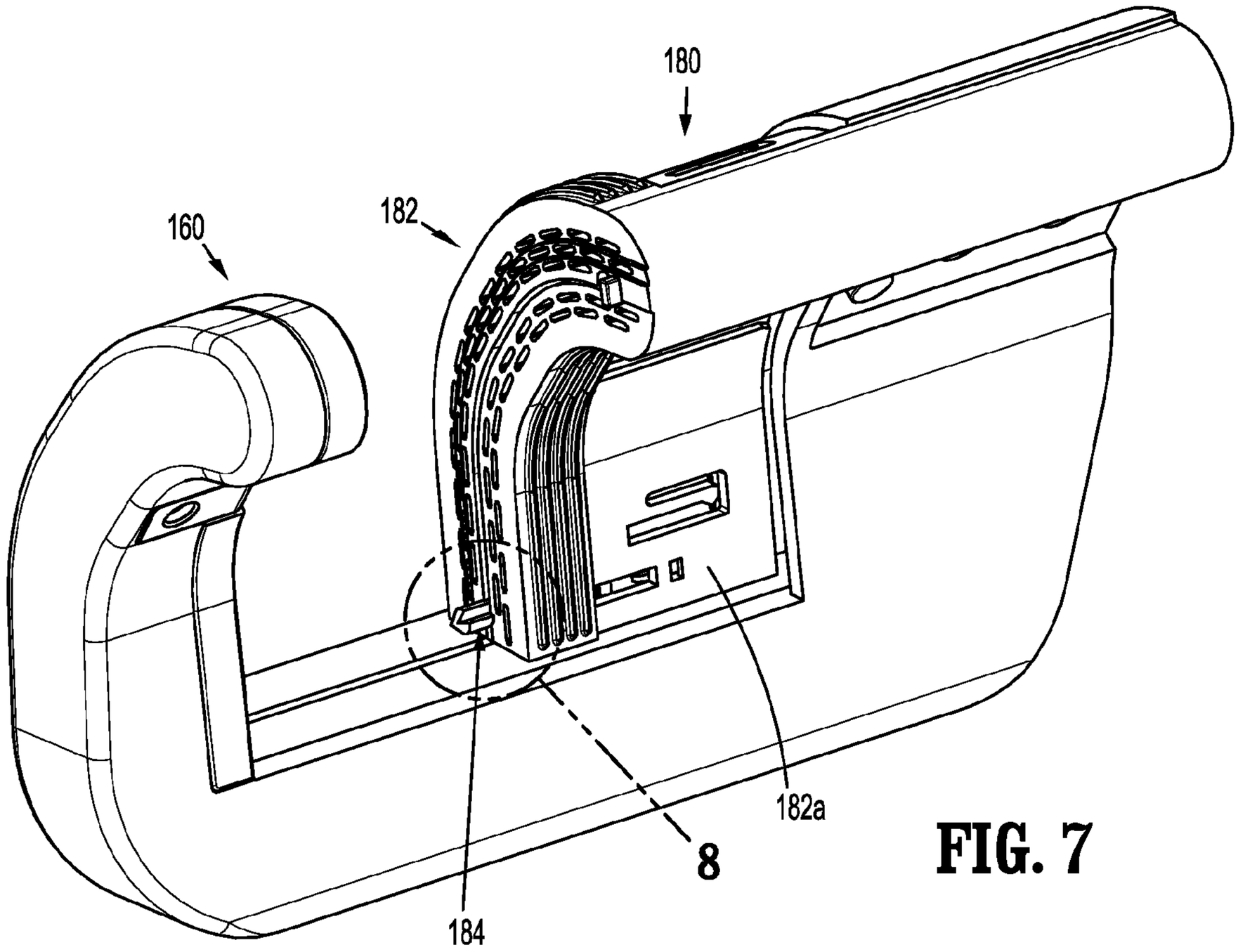


FIG. 7

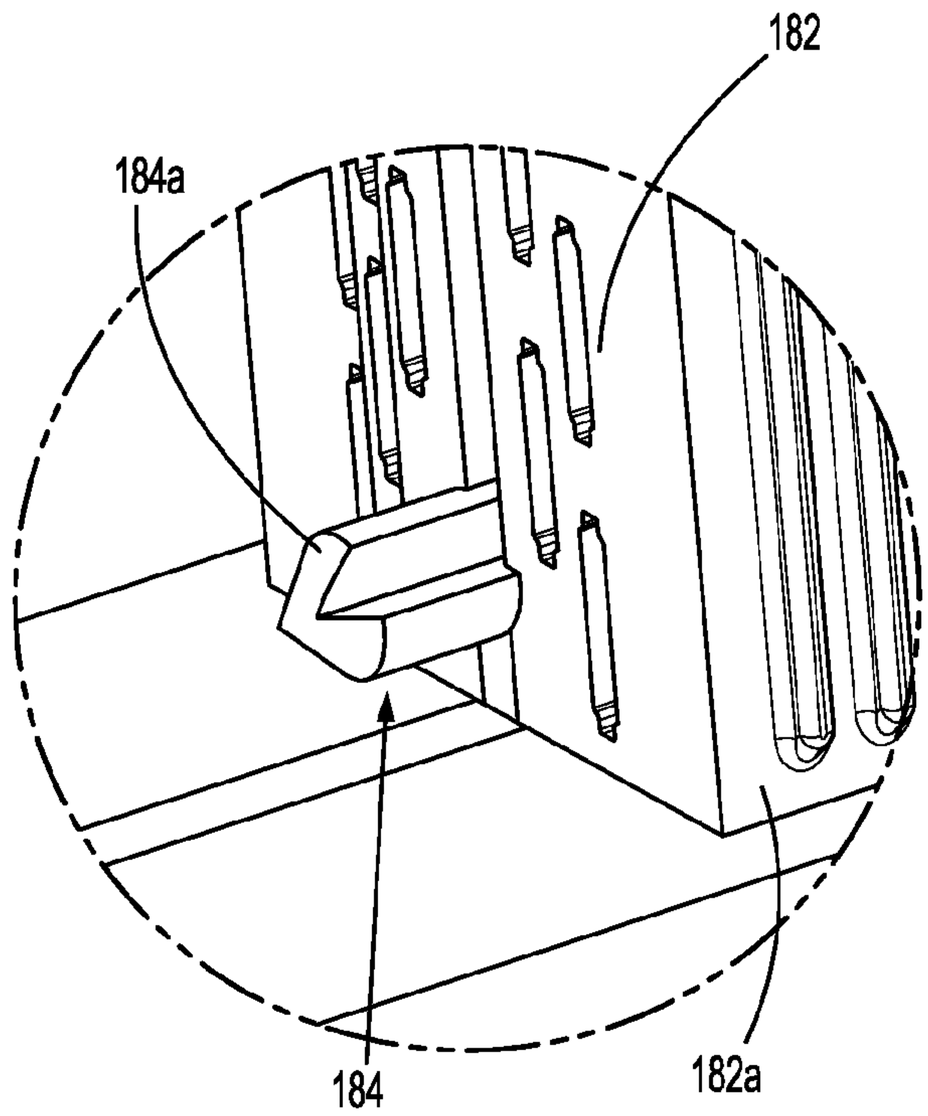


FIG. 8

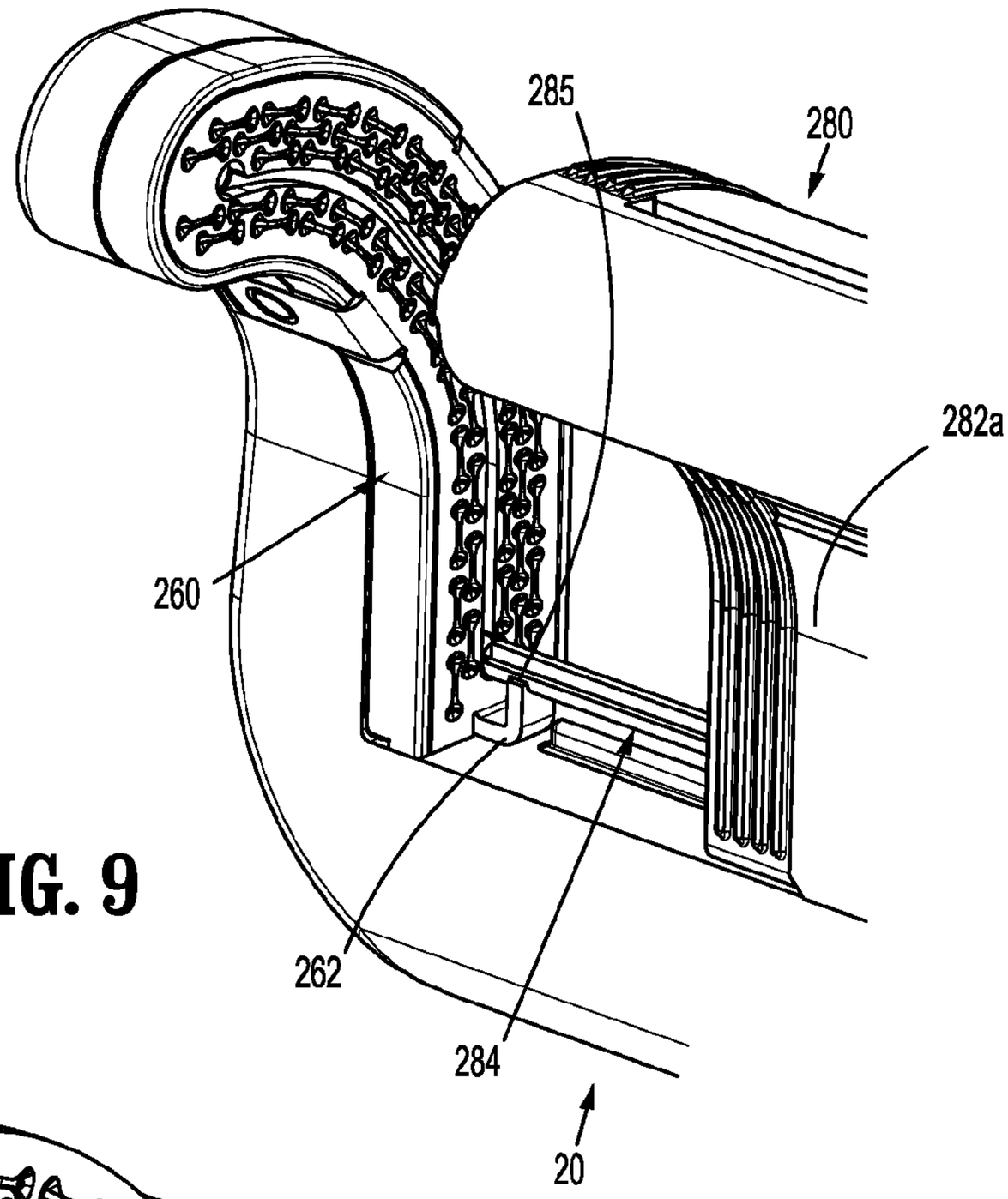
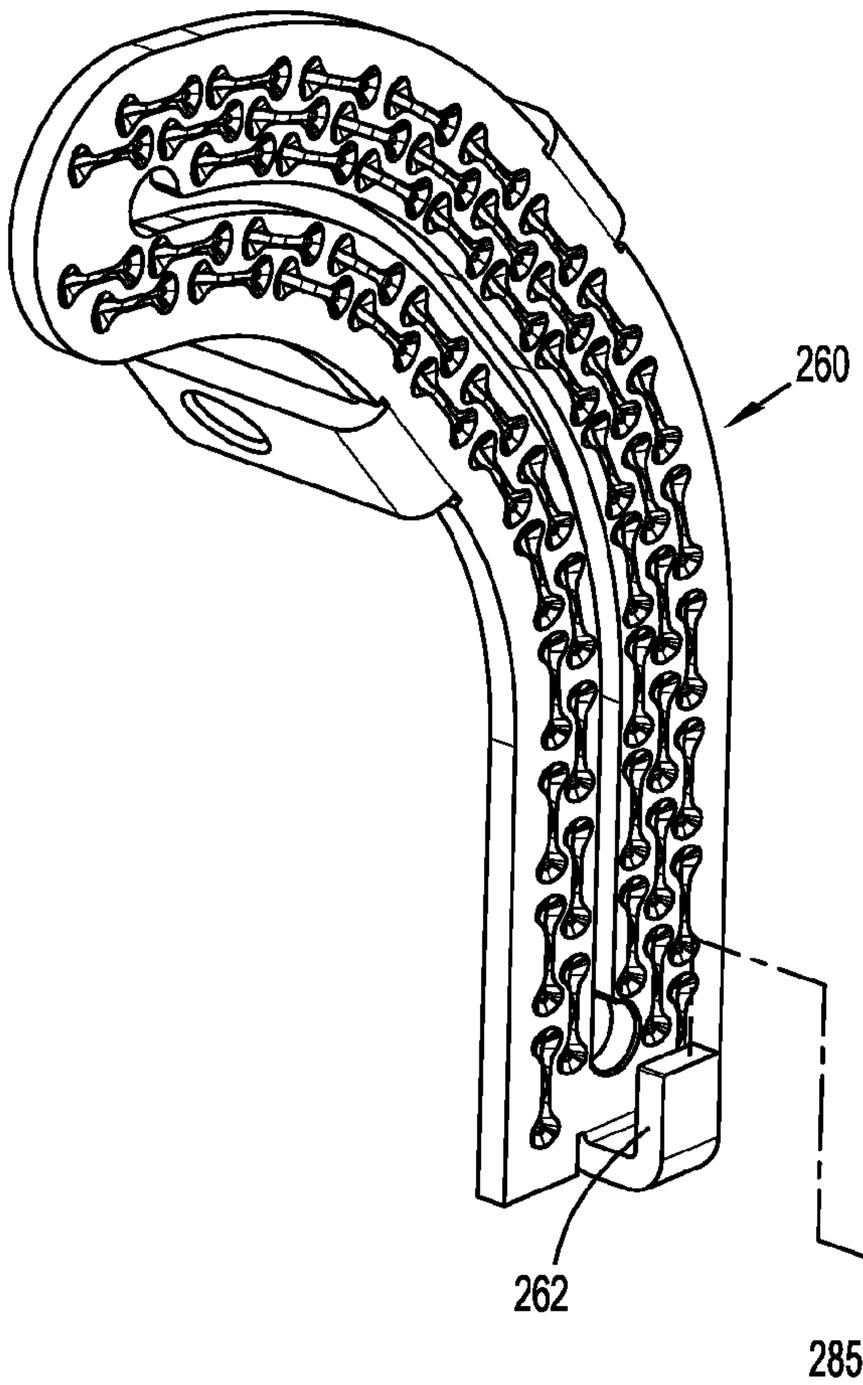


FIG. 9



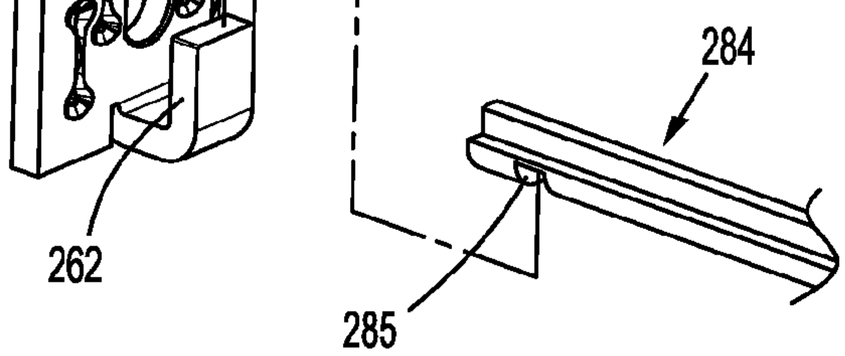


FIG. 10

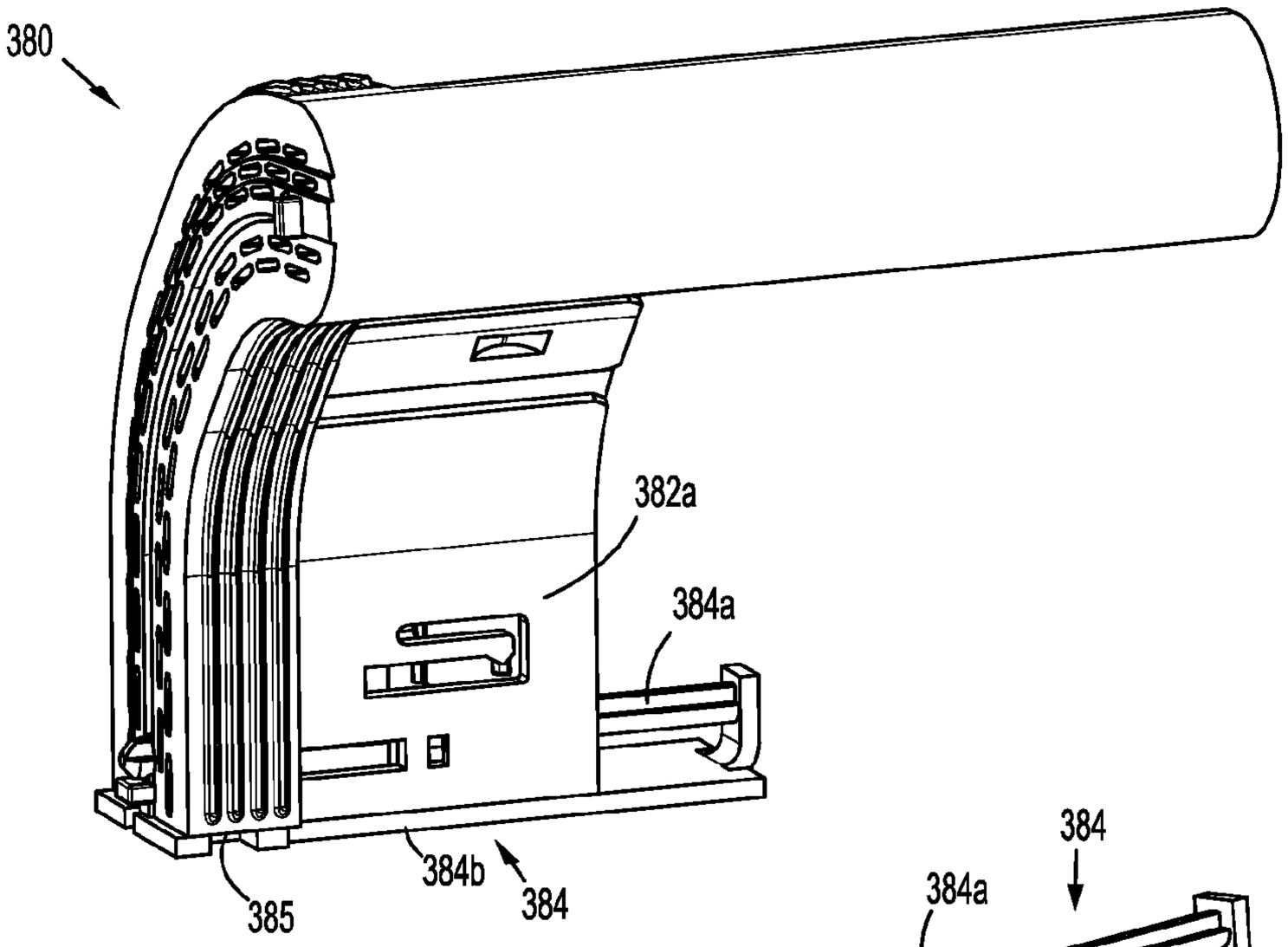


FIG. 11

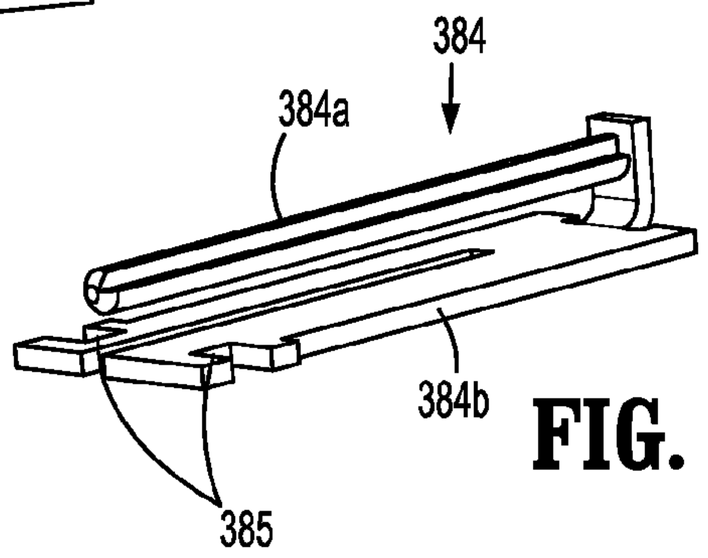


FIG. 12

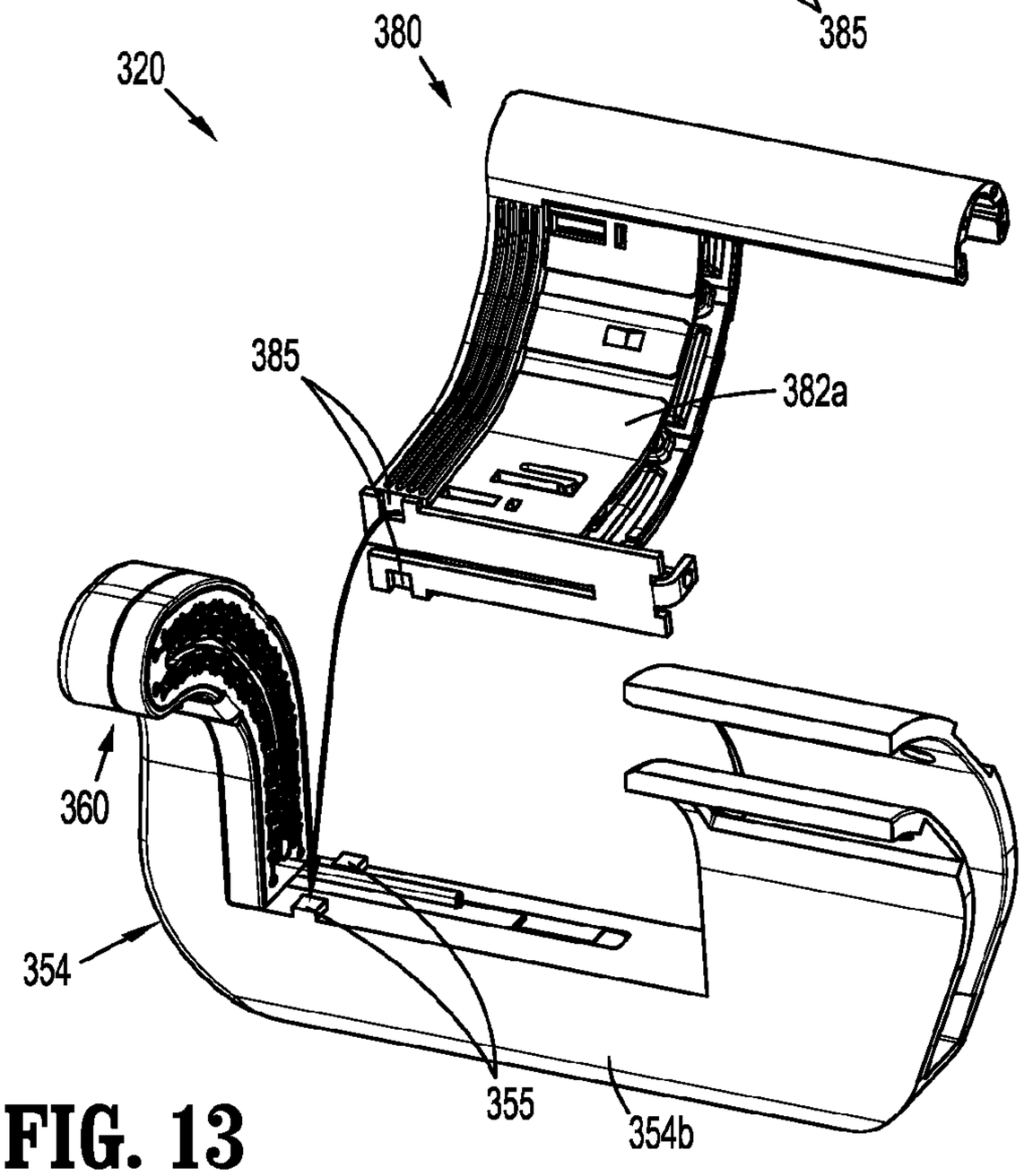


FIG. 13

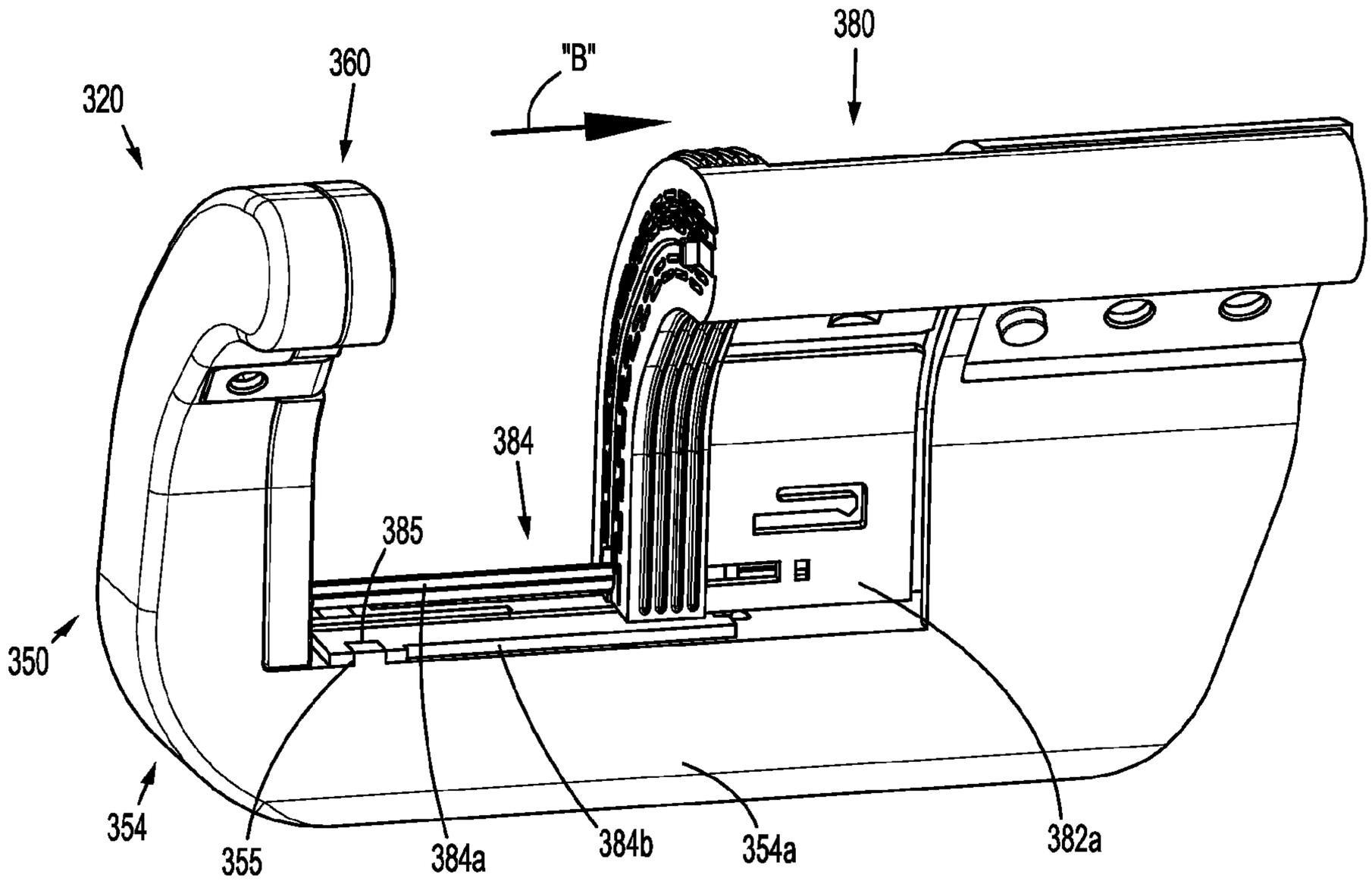

320
360
"B"
380
384
385
350
354
355
384a
384b
354a
382a

FIG. 14

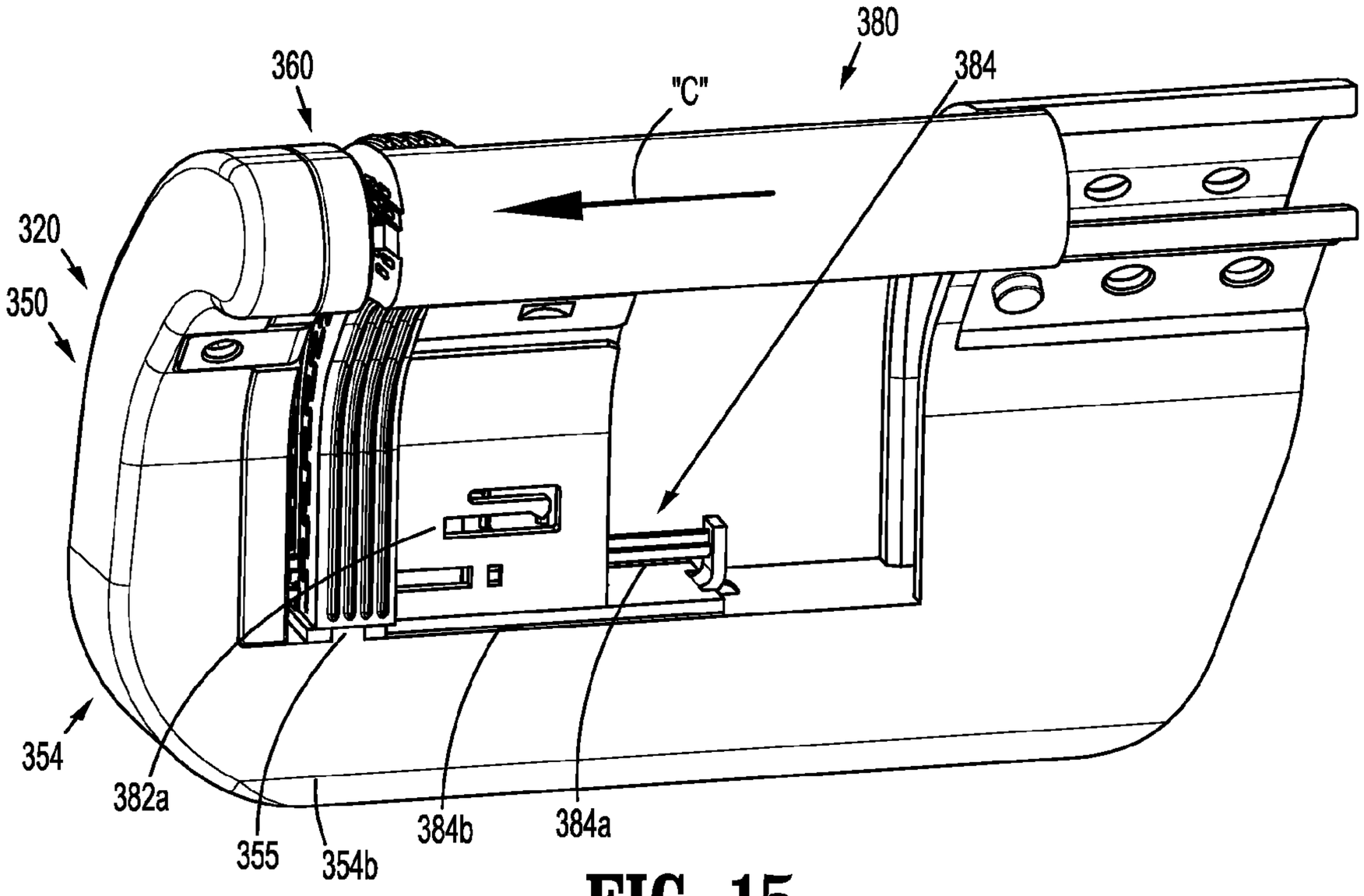

360
"C"
380
384
320
350
354
382a
355
354b
384b
384a

FIG. 15

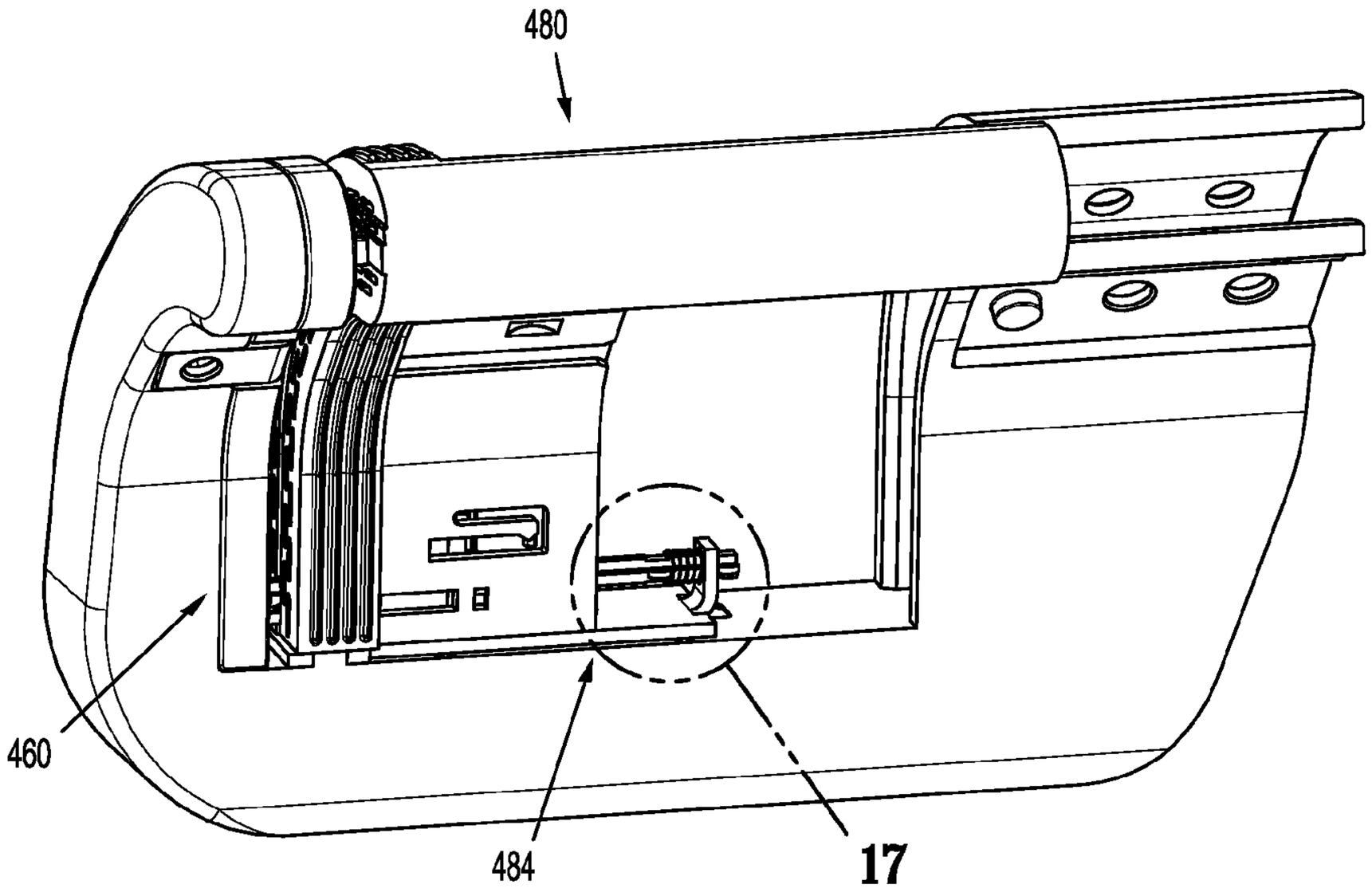


FIG. 16

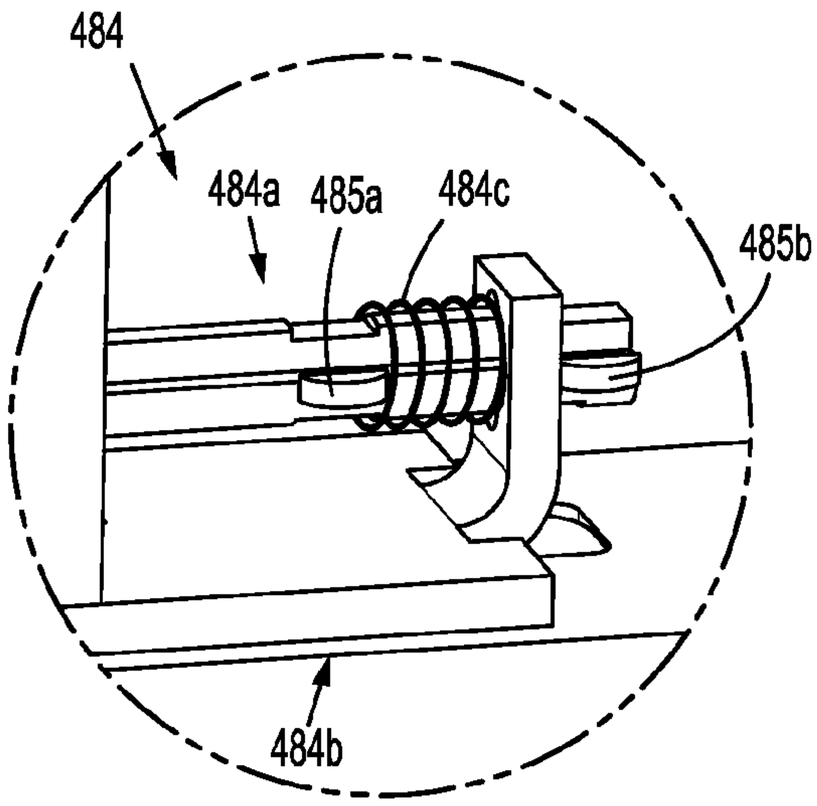


FIG. 17

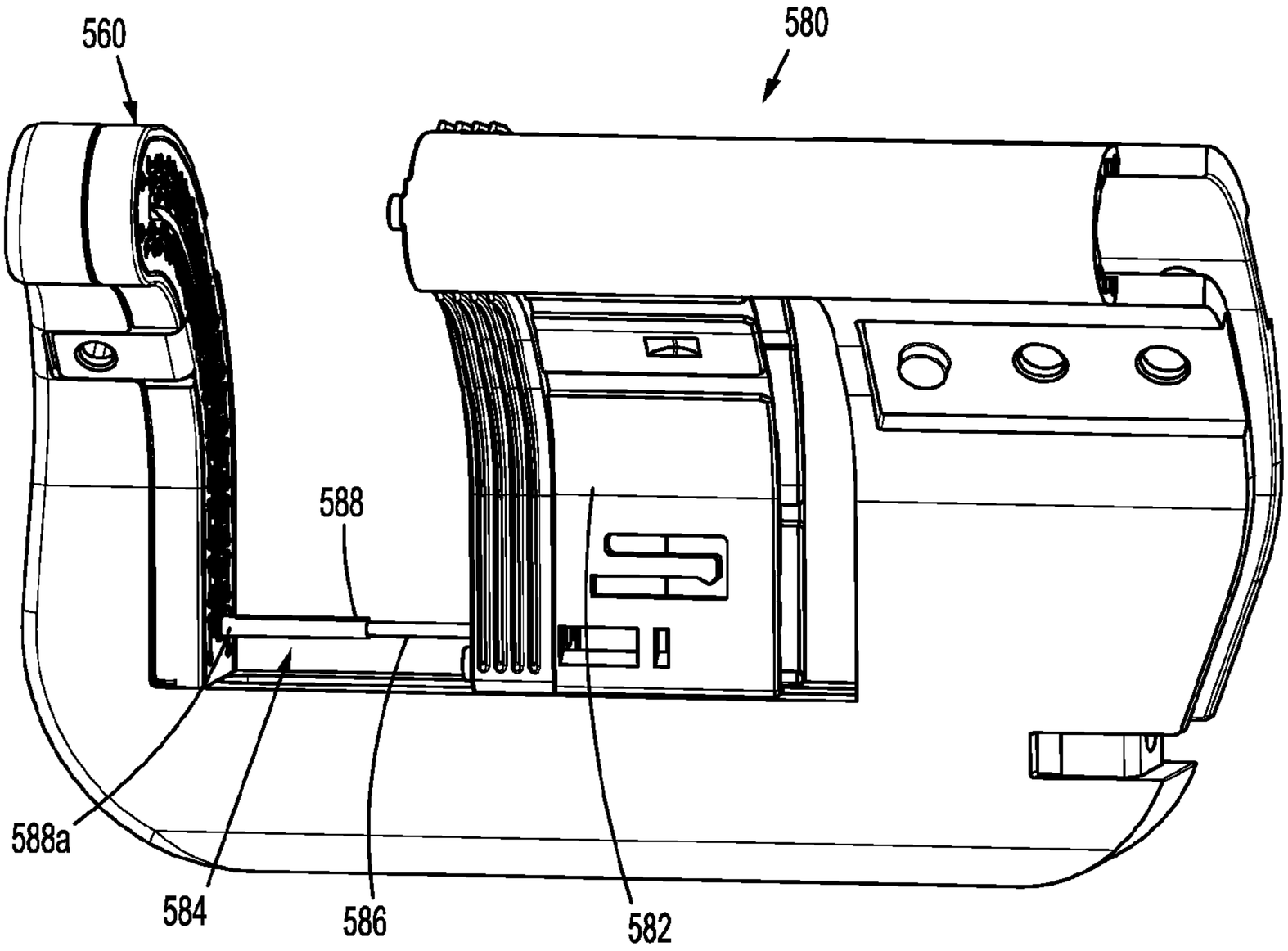


FIG. 18

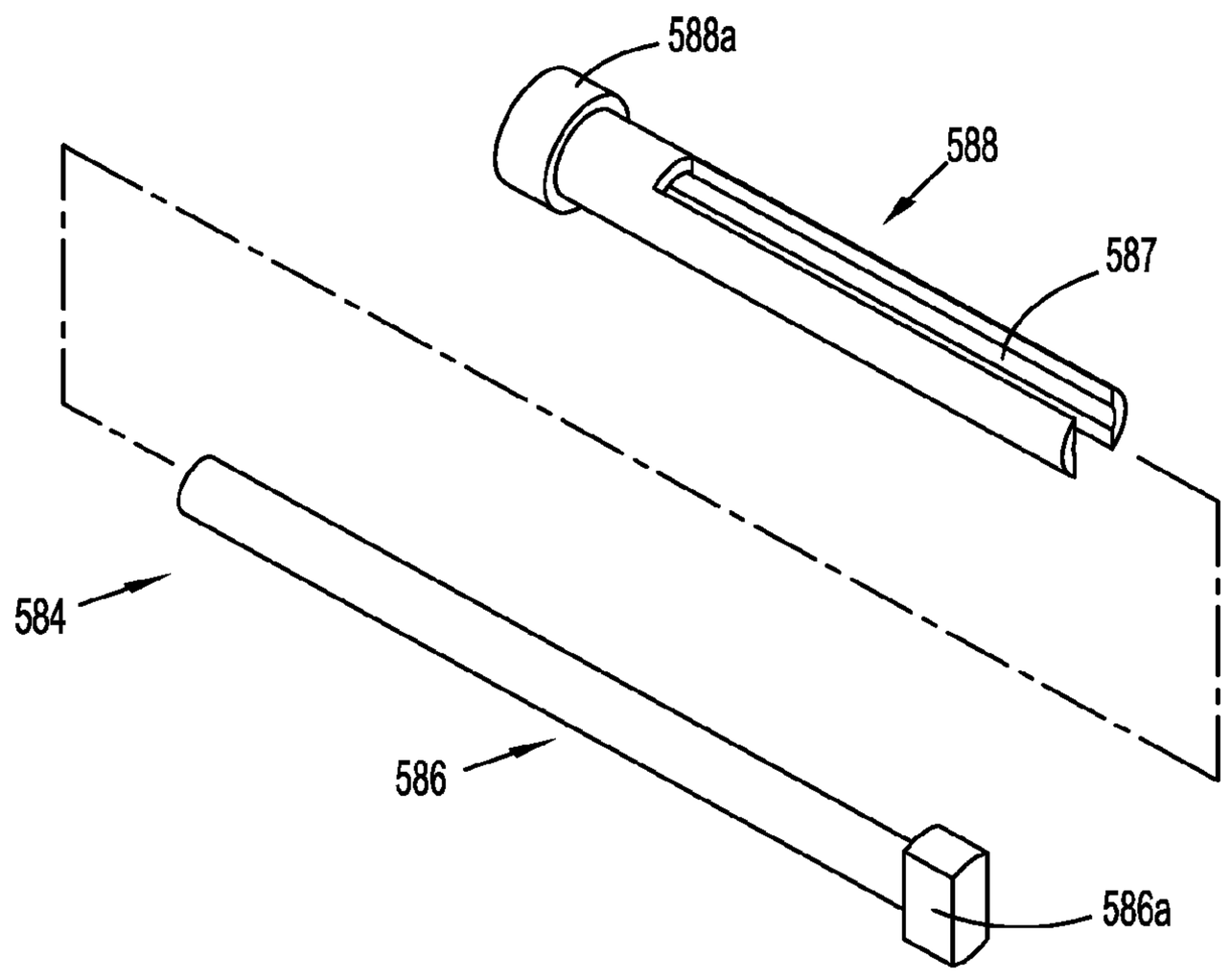


FIG. 19

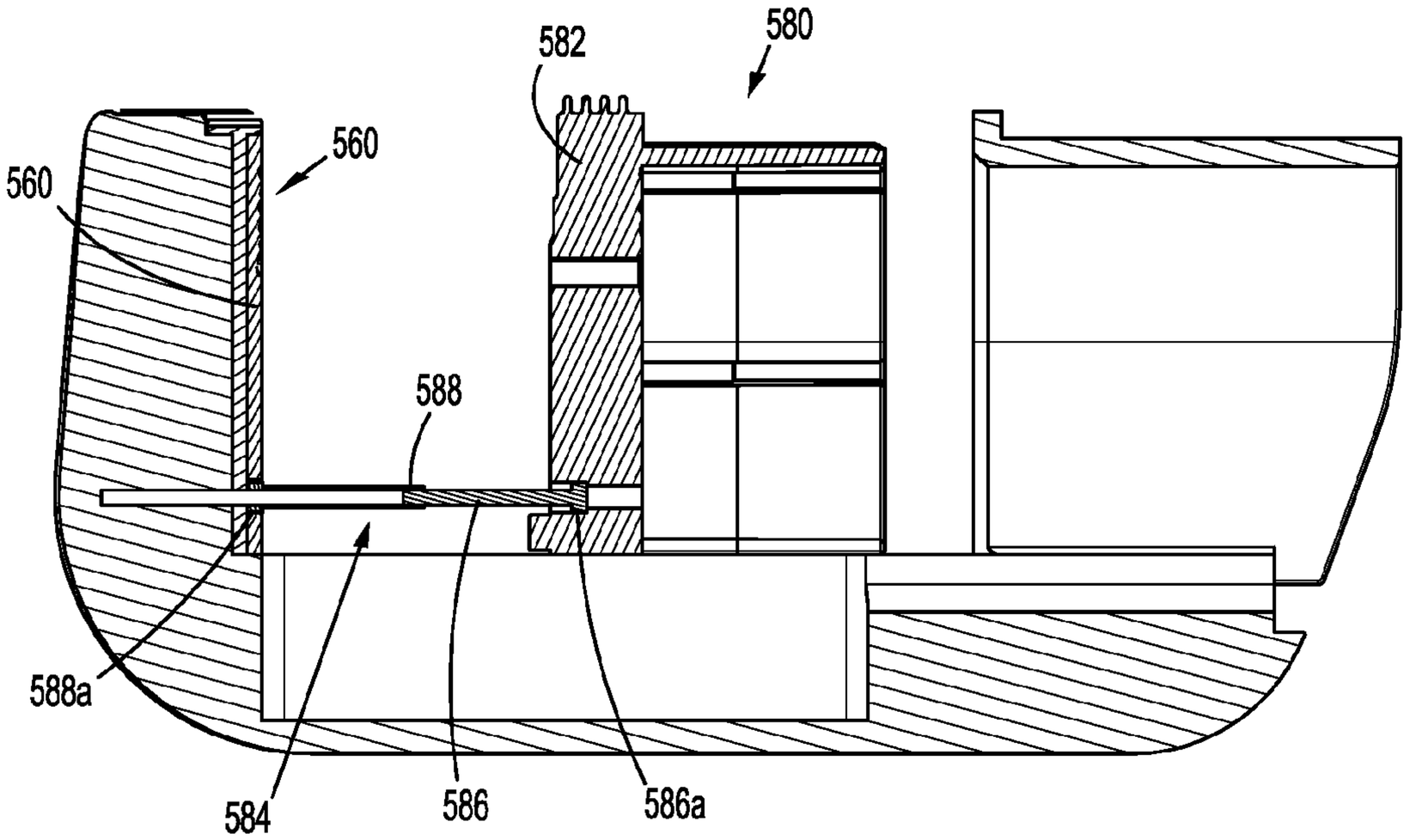

582
580
560
560
588
588a
584
586
586a

FIG. 20

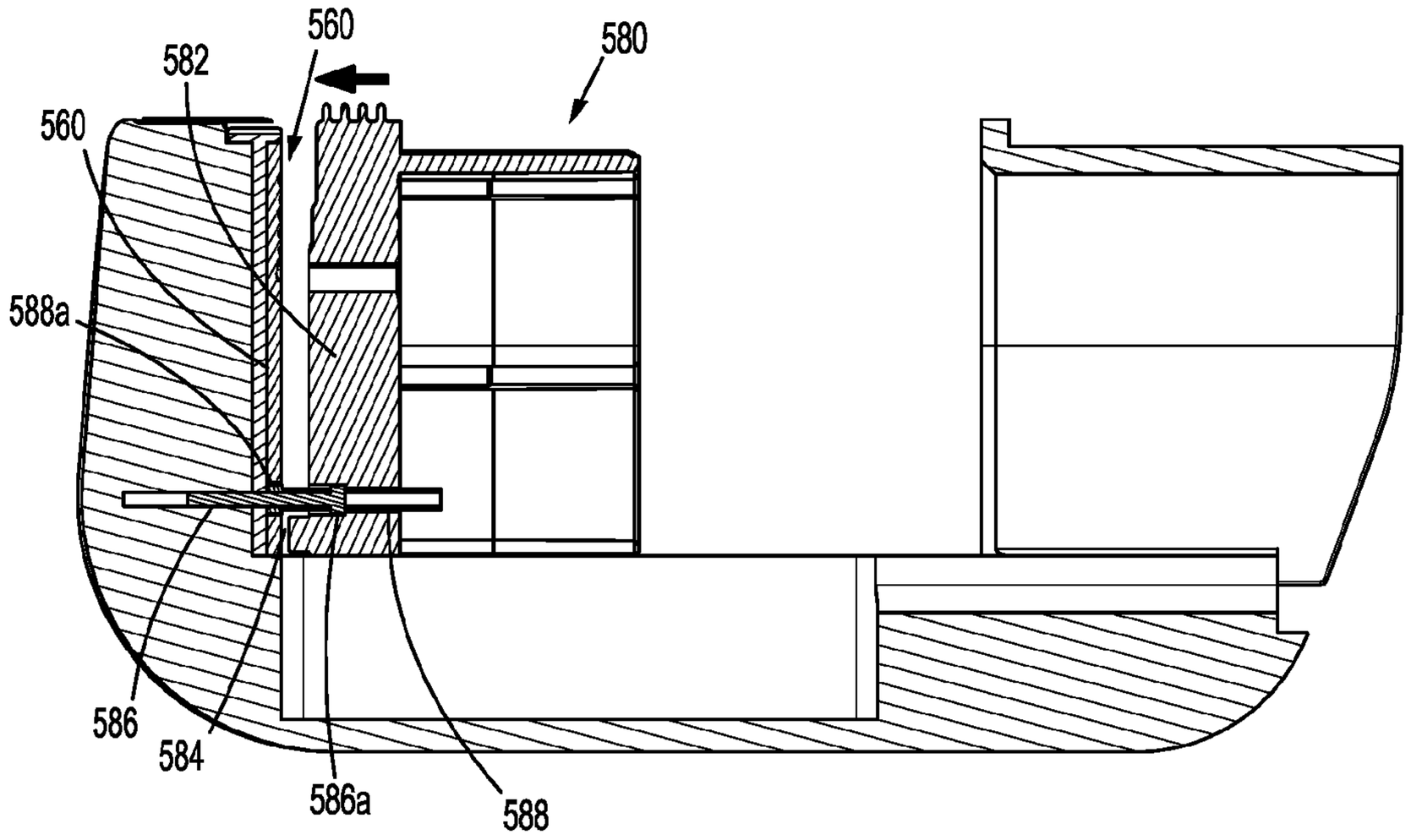

560
582
580
560
588a
586
584
586a
588

FIG. 21

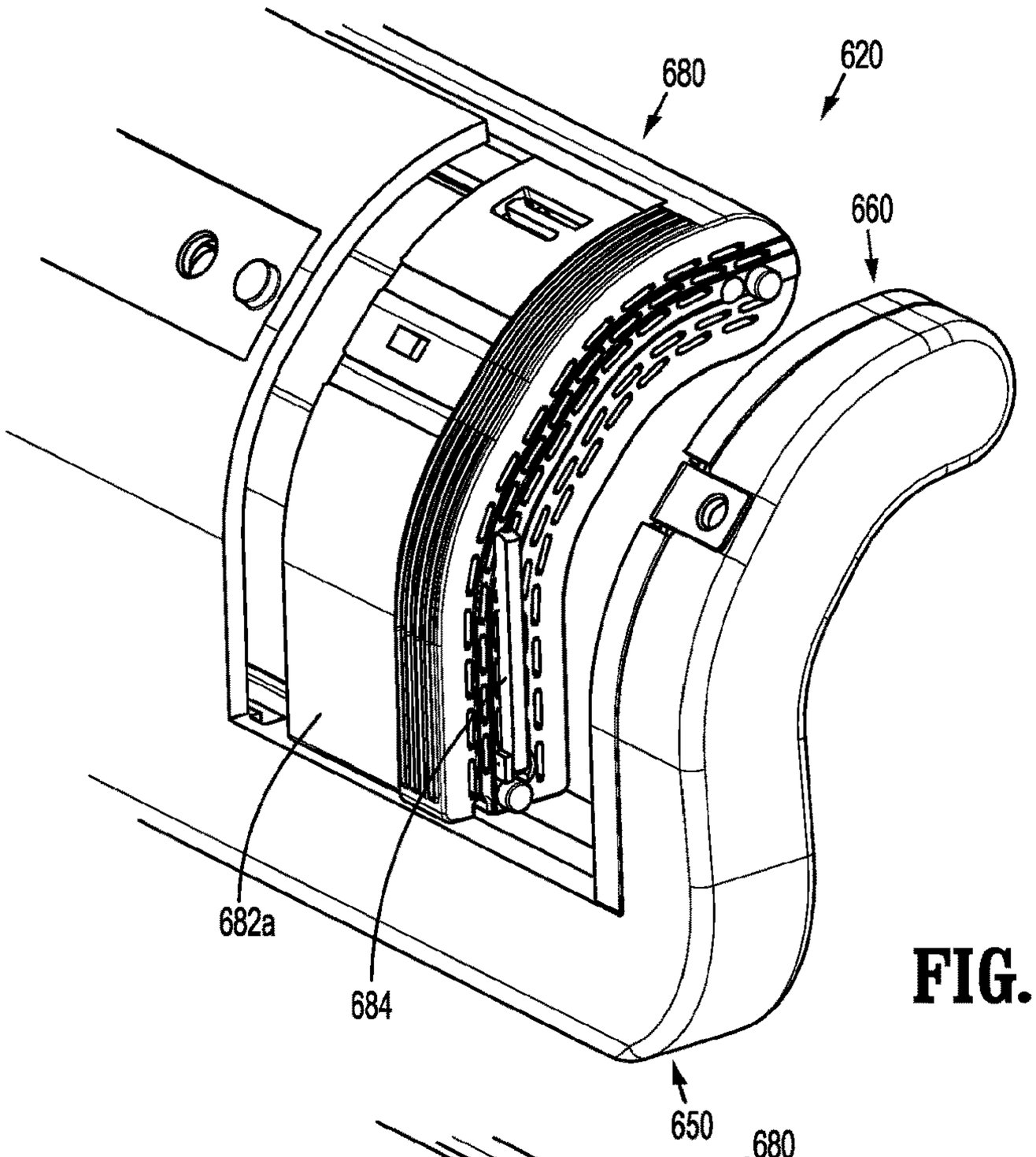


FIG. 22

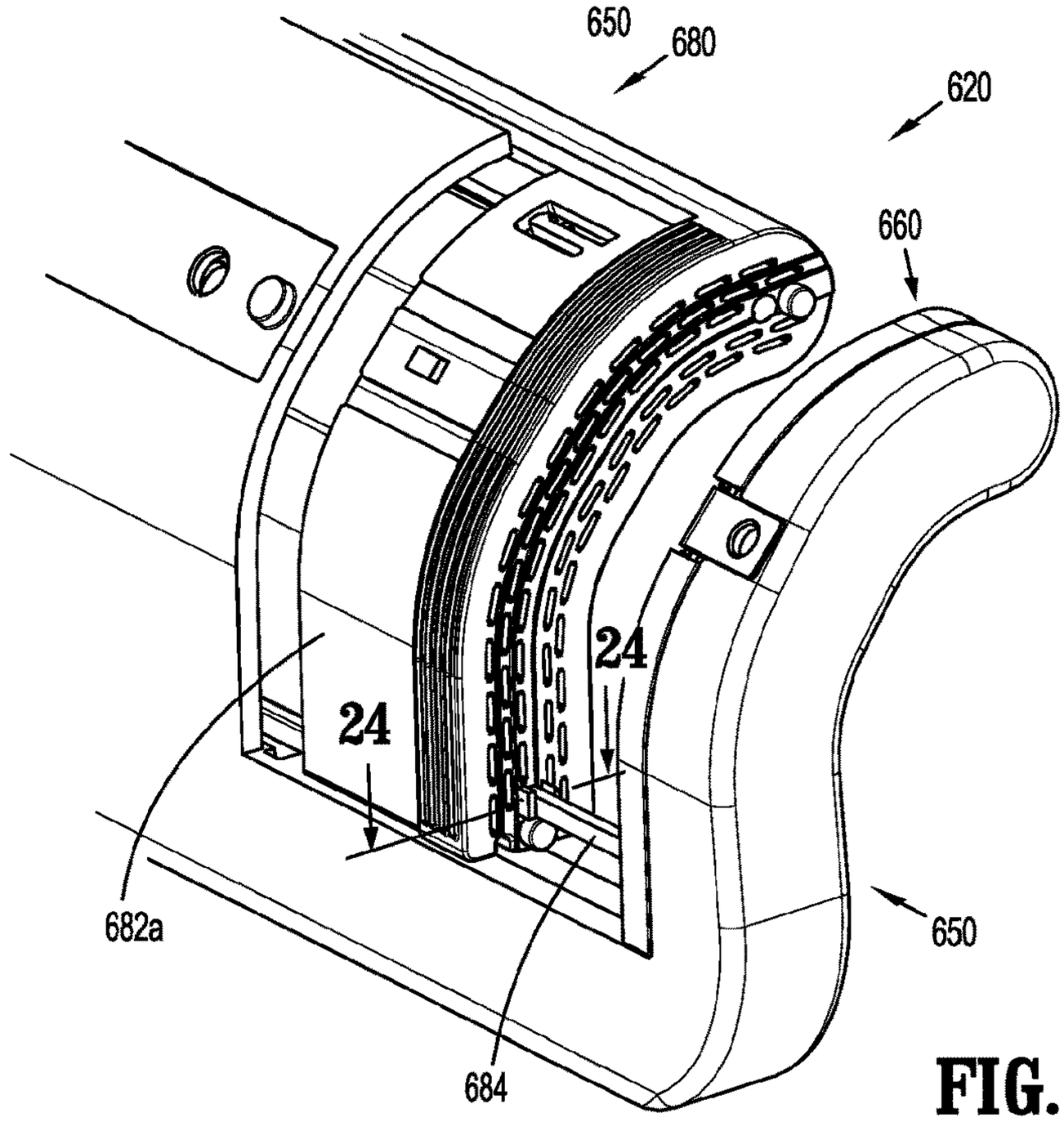


FIG. 23

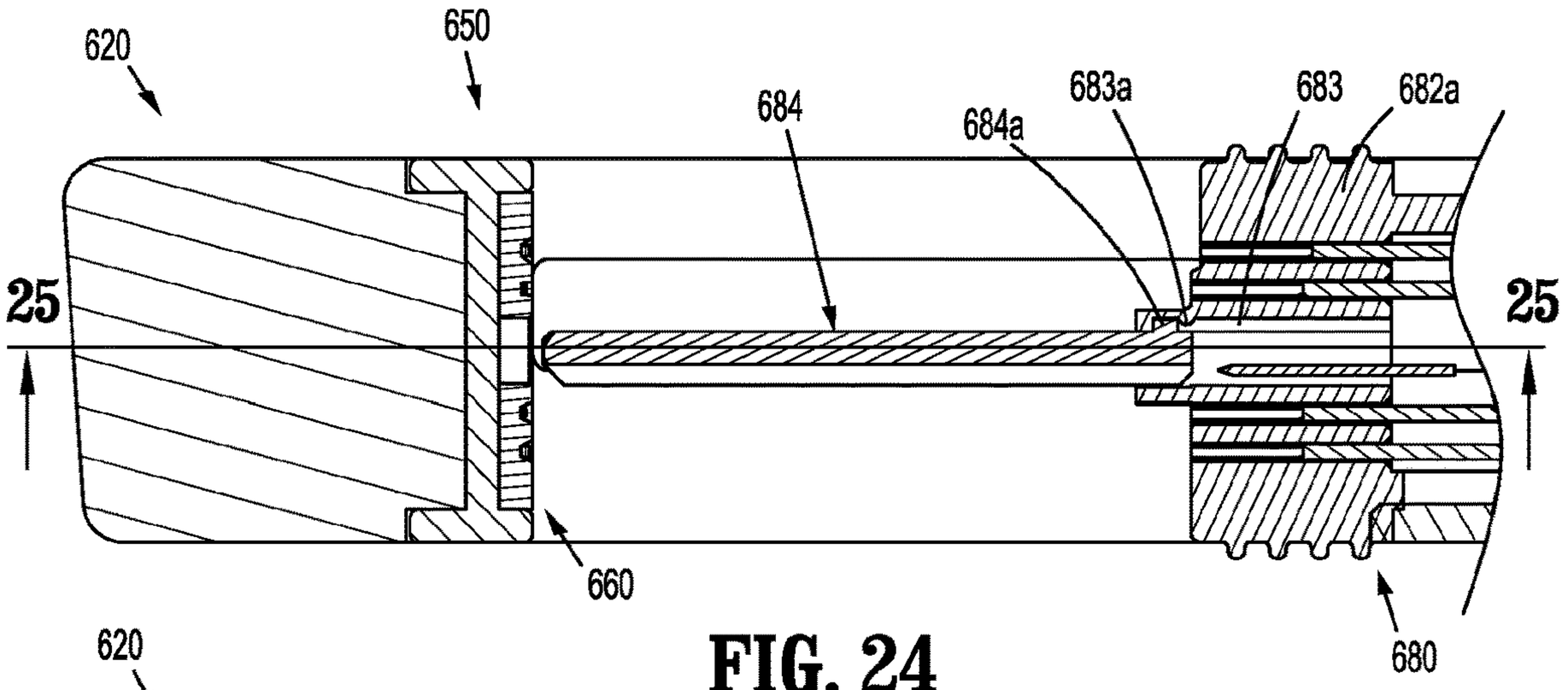

620
650
684
684a
683a
683
682a
25
25
660
680

FIG. 24

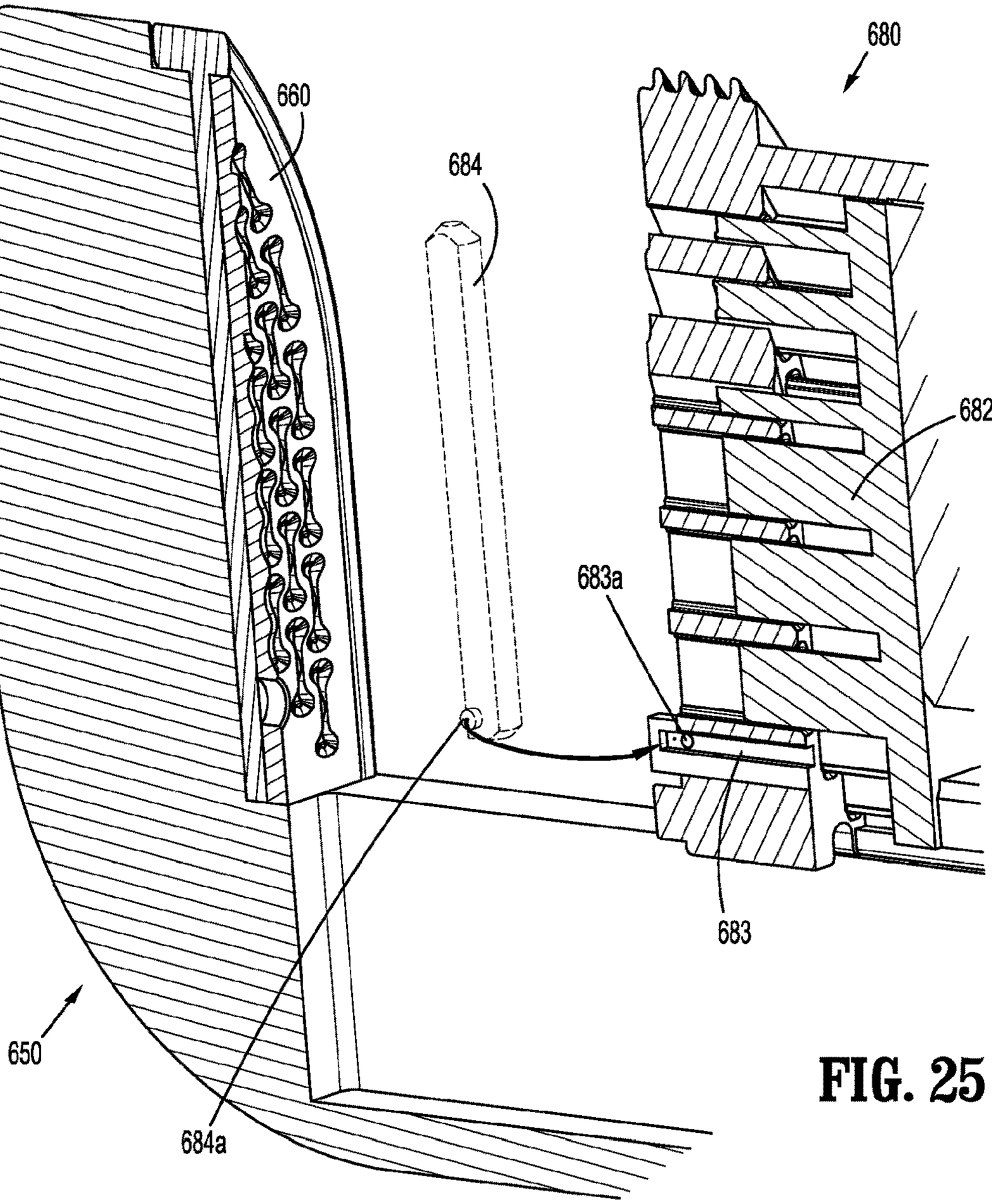

620
660
684
680
682a
683a
683
650
684a

FIG. 25

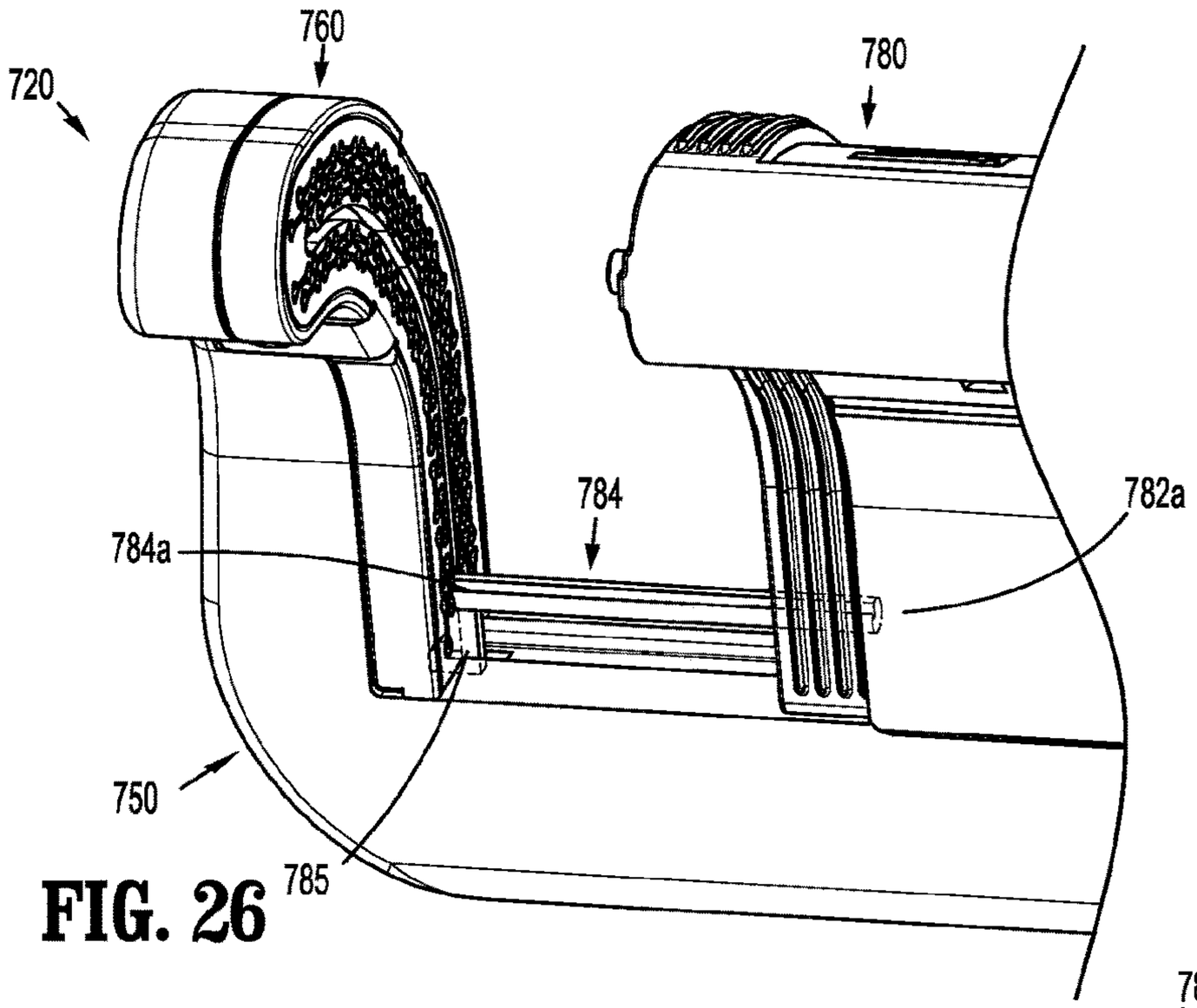


FIG. 26

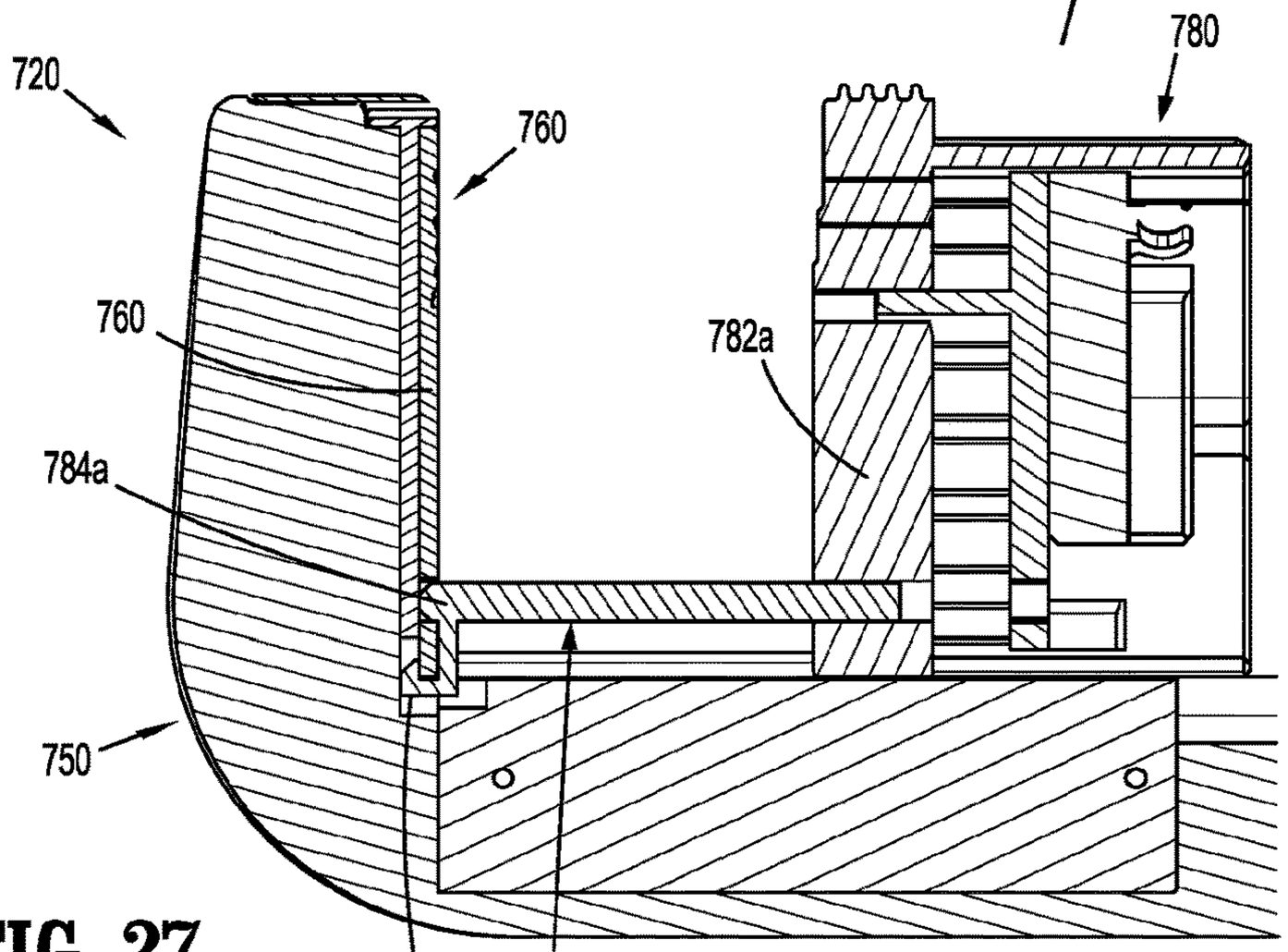


FIG. 27

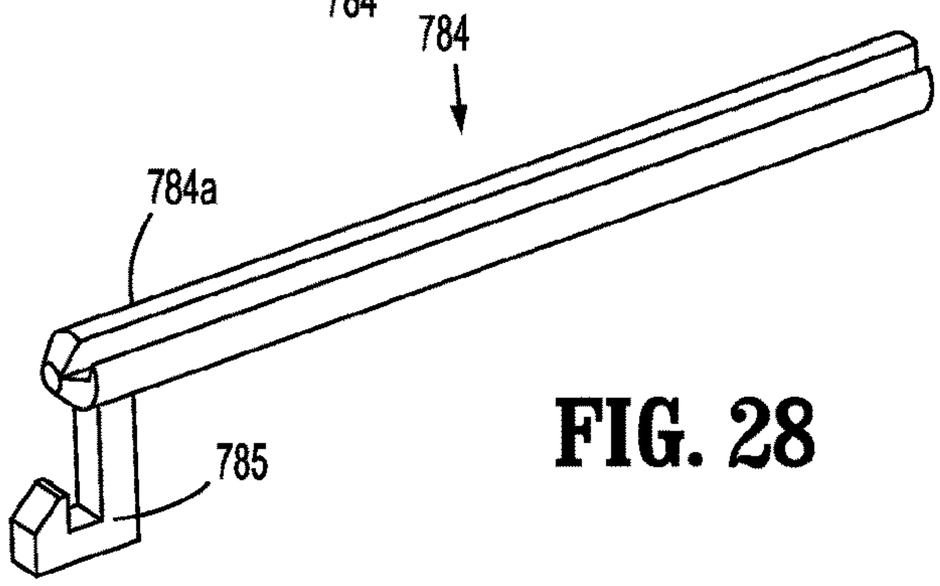


FIG. 28

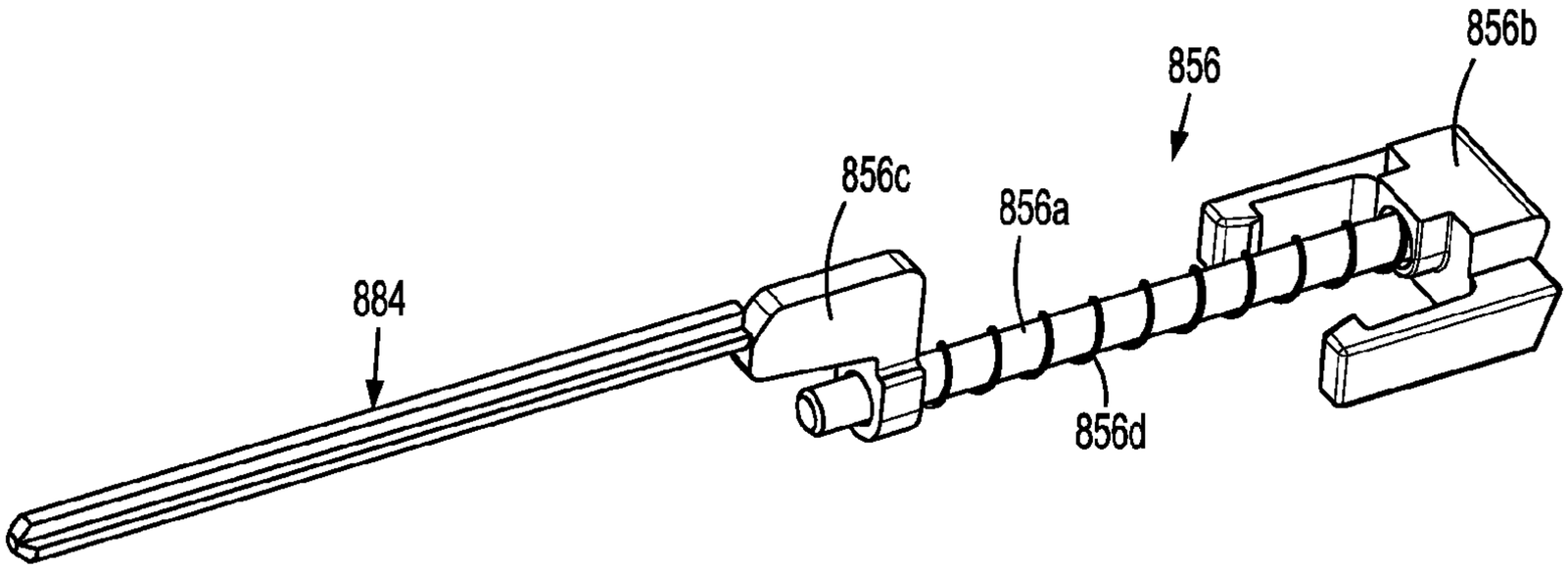

856b
856
856c
856a
884
856d

FIG. 29

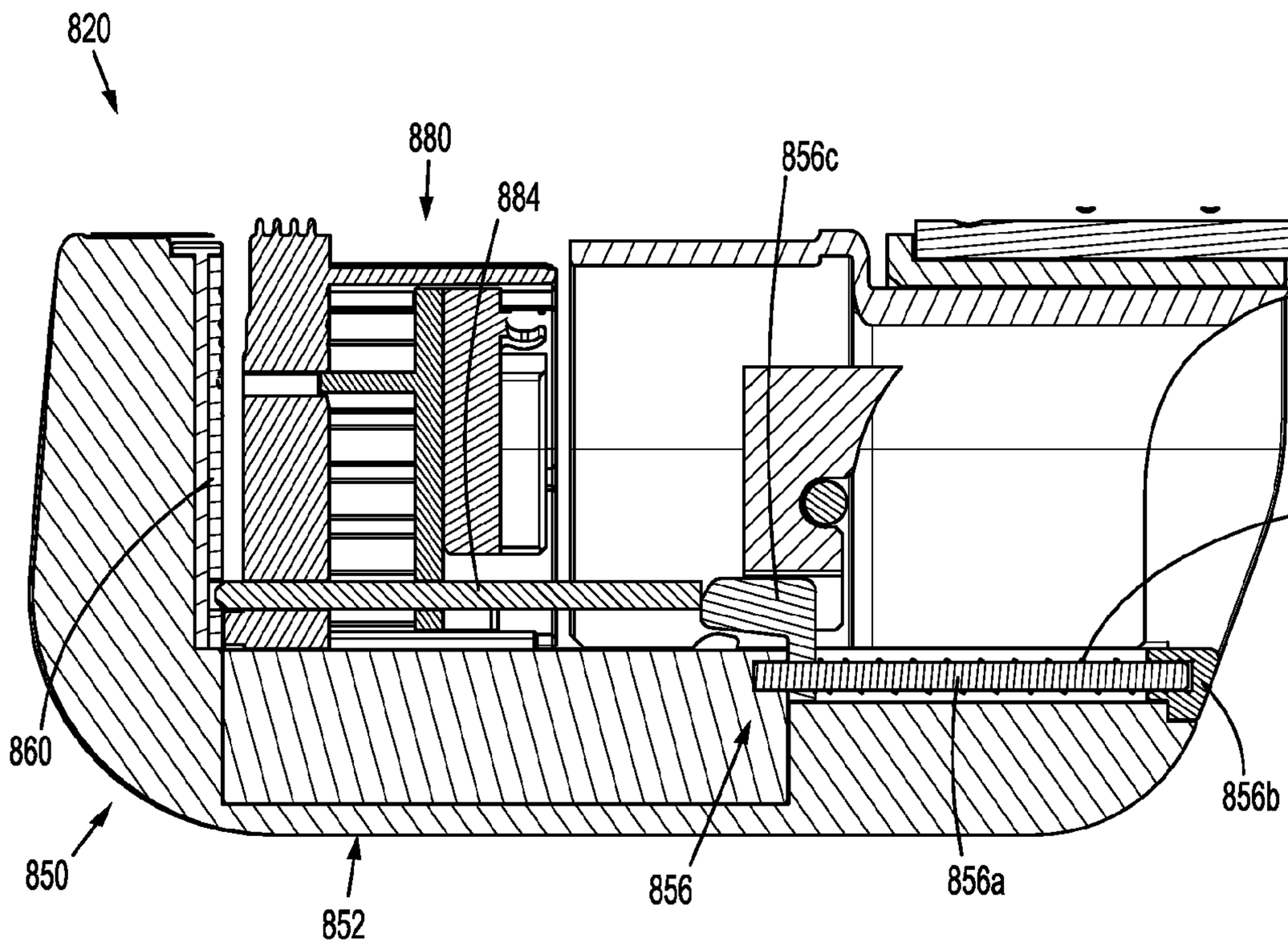

820
880
884
856c
856d
860
850
852
856
856a
856b

FIG. 30

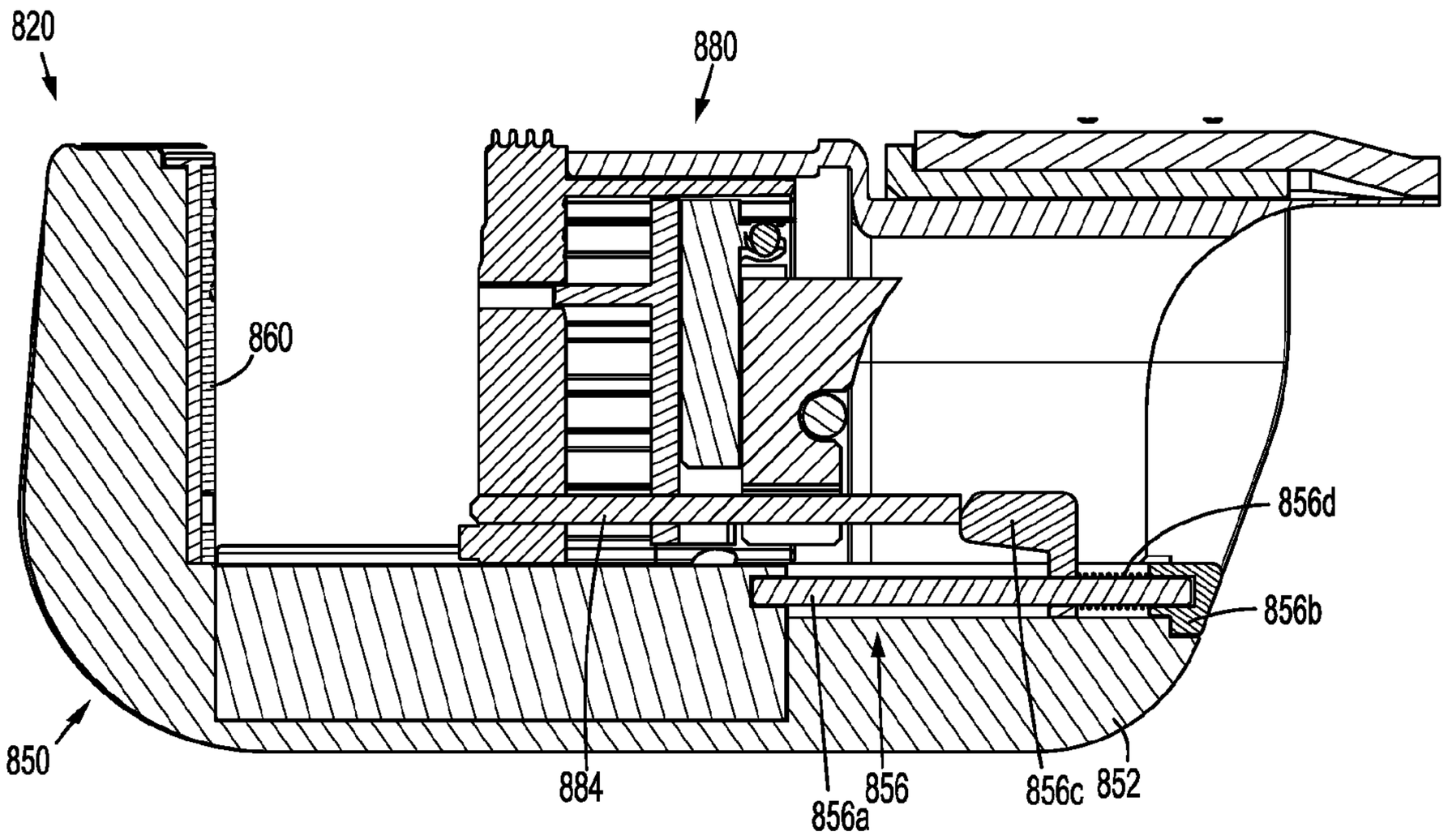

820
880
860
856d
856b
850
884
856a
856
856c
852

FIG. 31

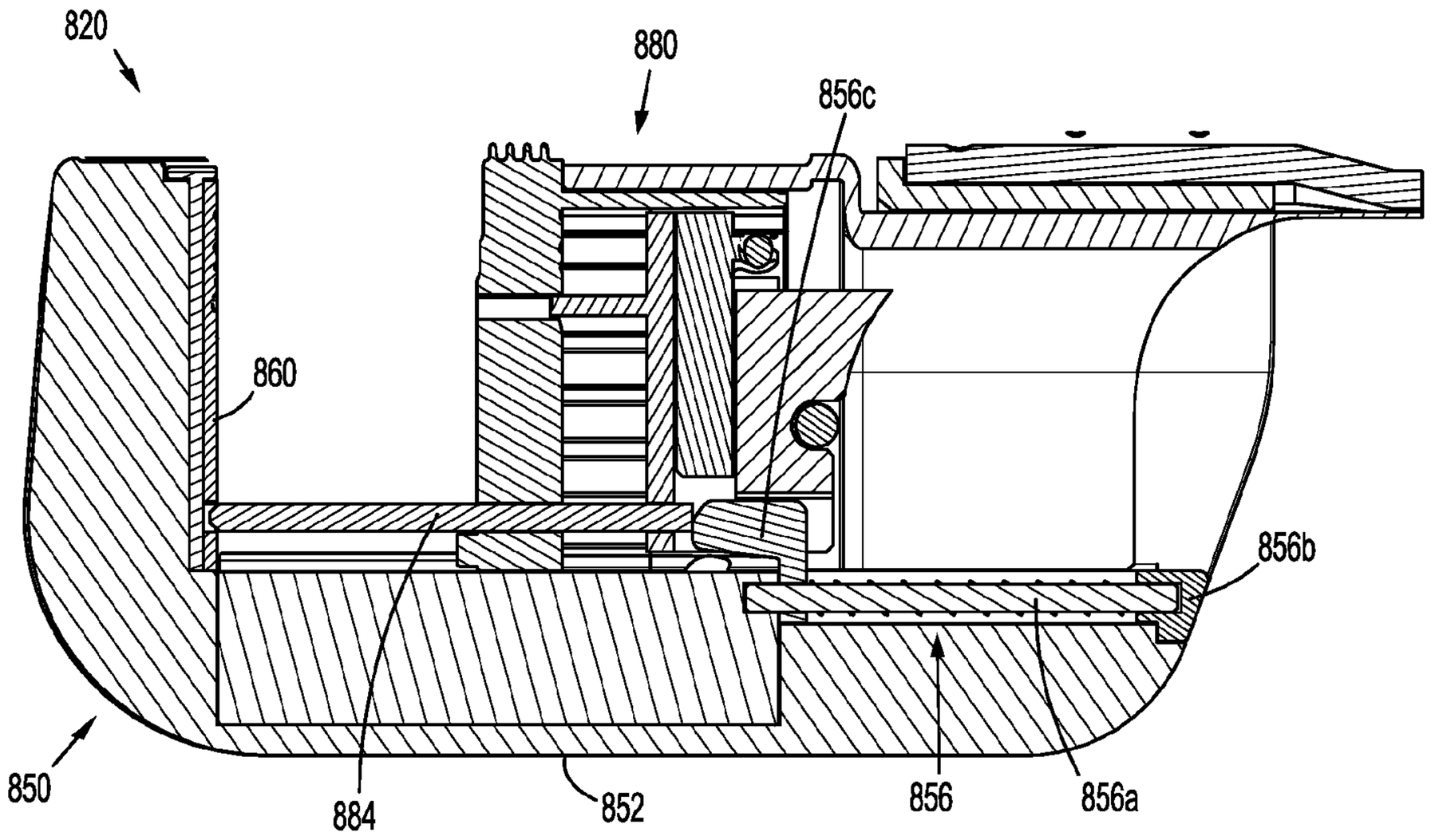

820
880
856c
860
856b
850
884
852
856
856a

FIG. 32

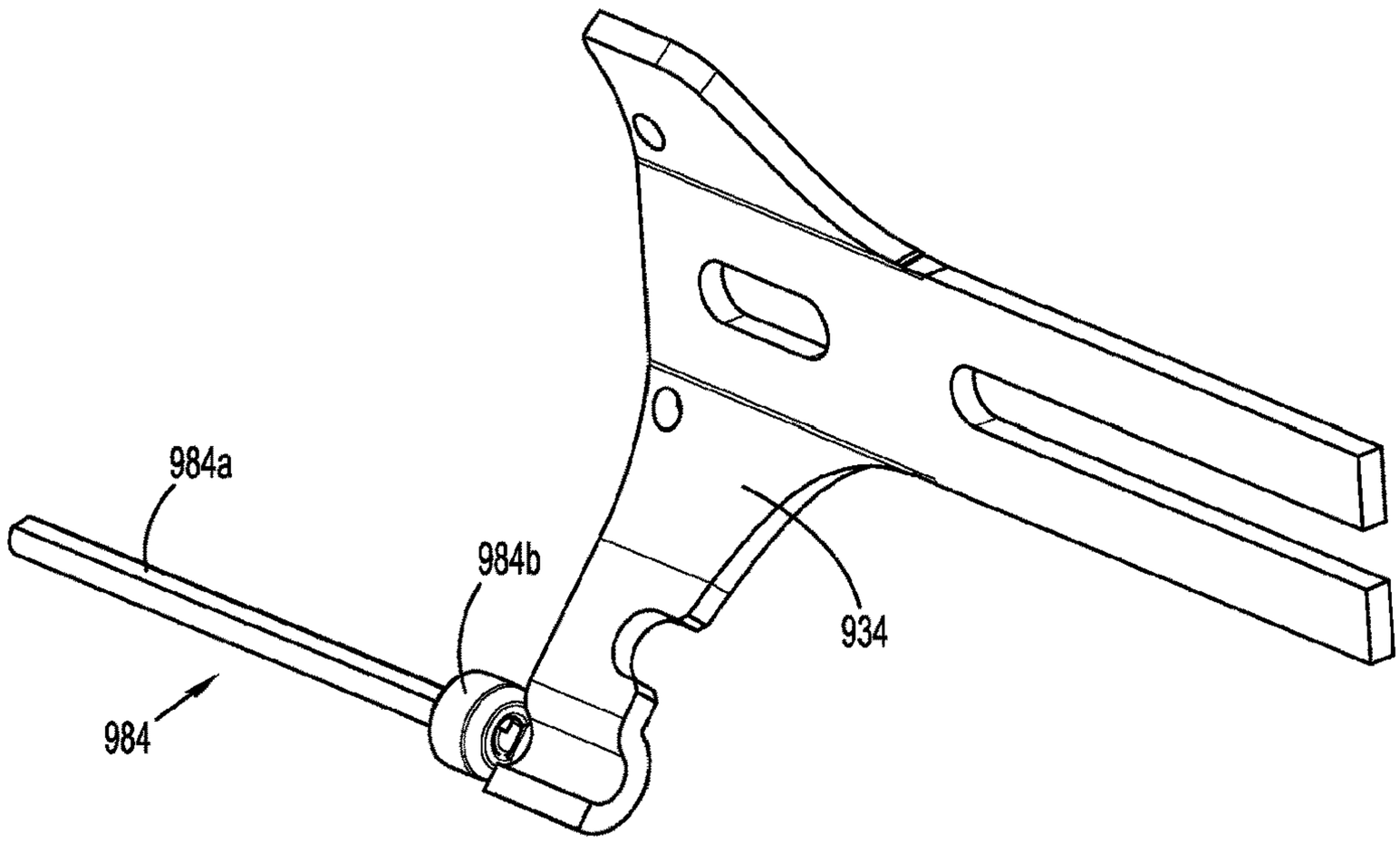


FIG. 33

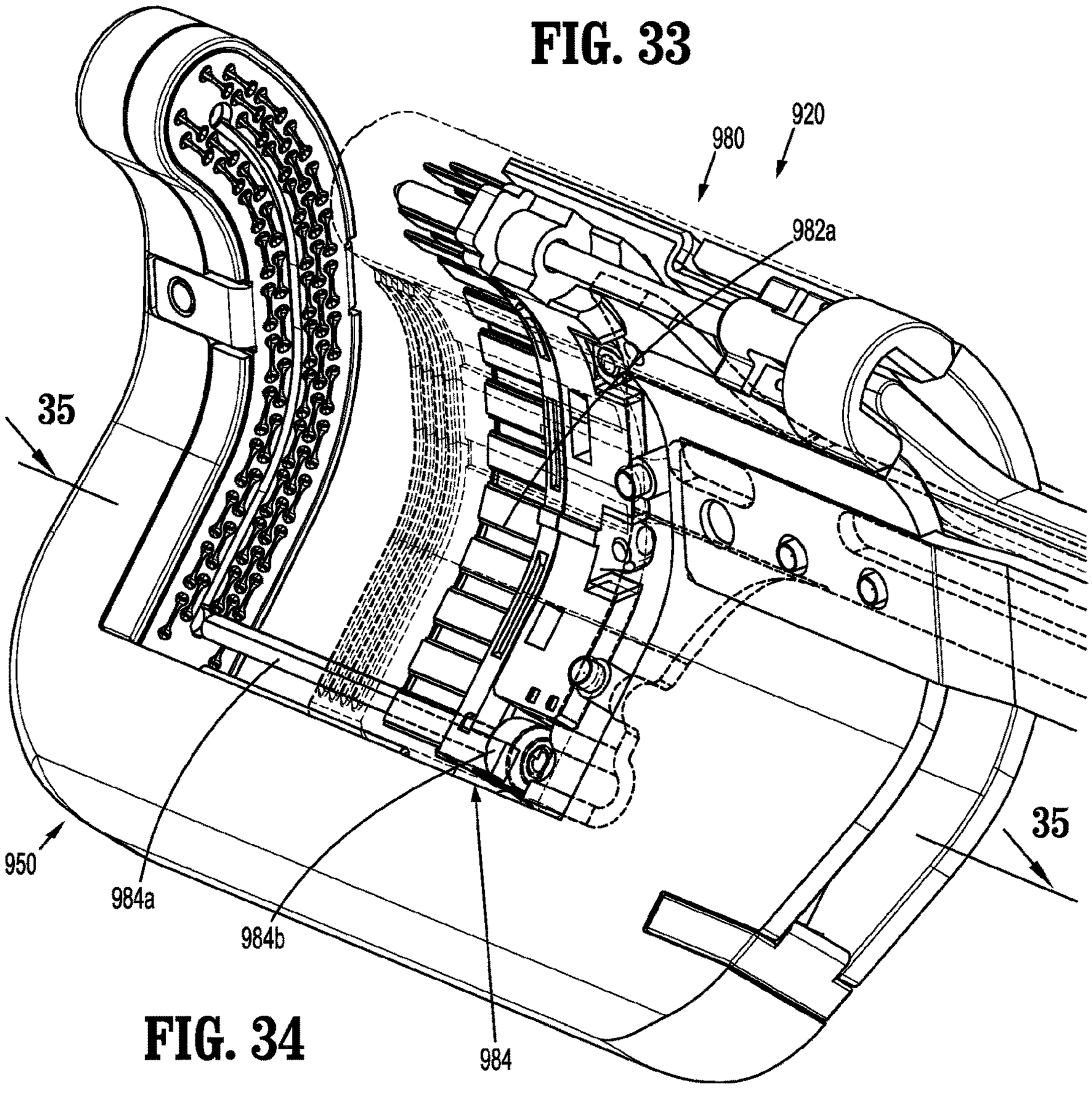


FIG. 34

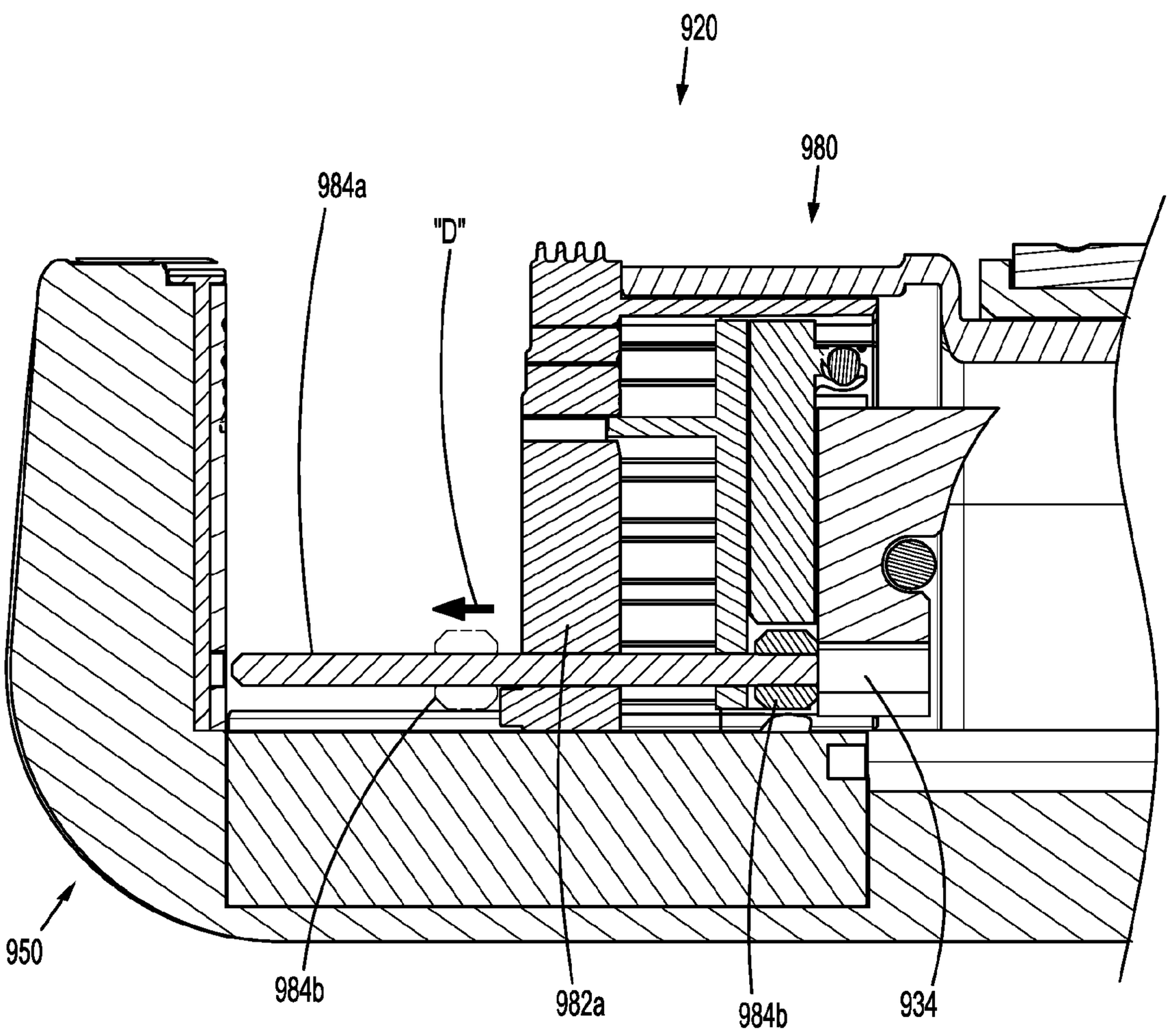


FIG. 35

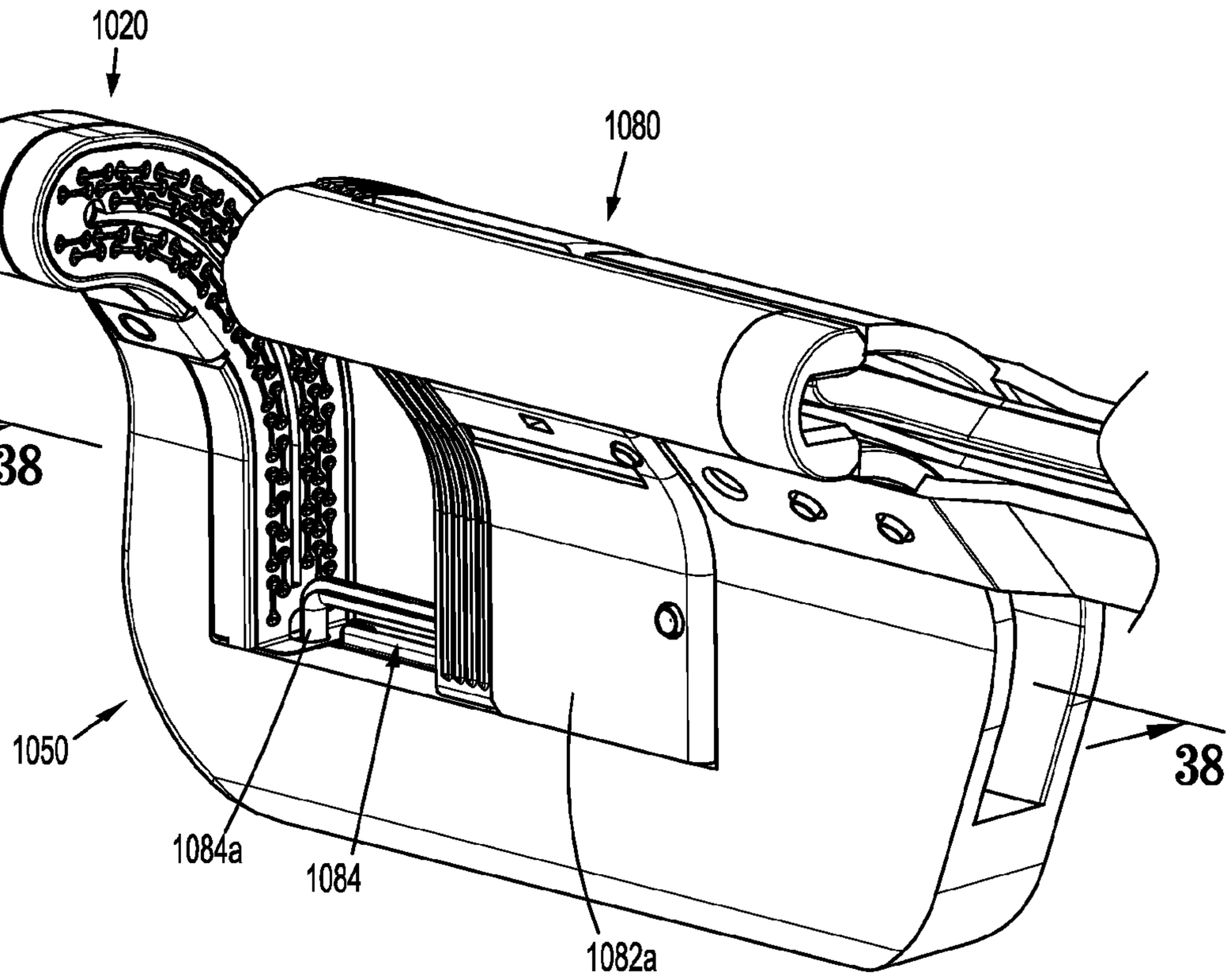


FIG. 36

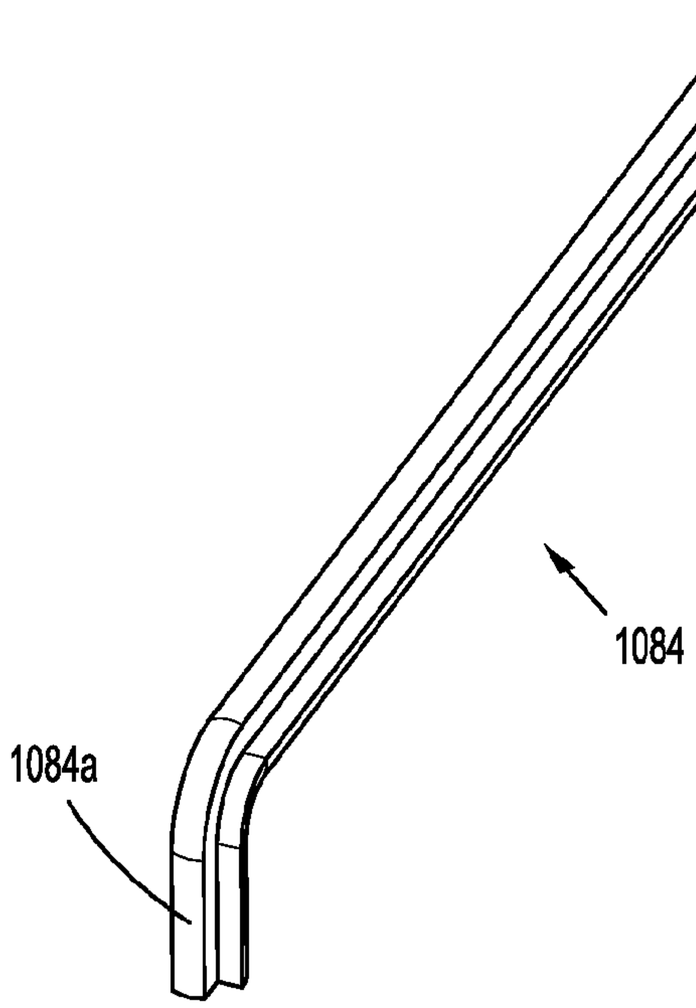


FIG. 37

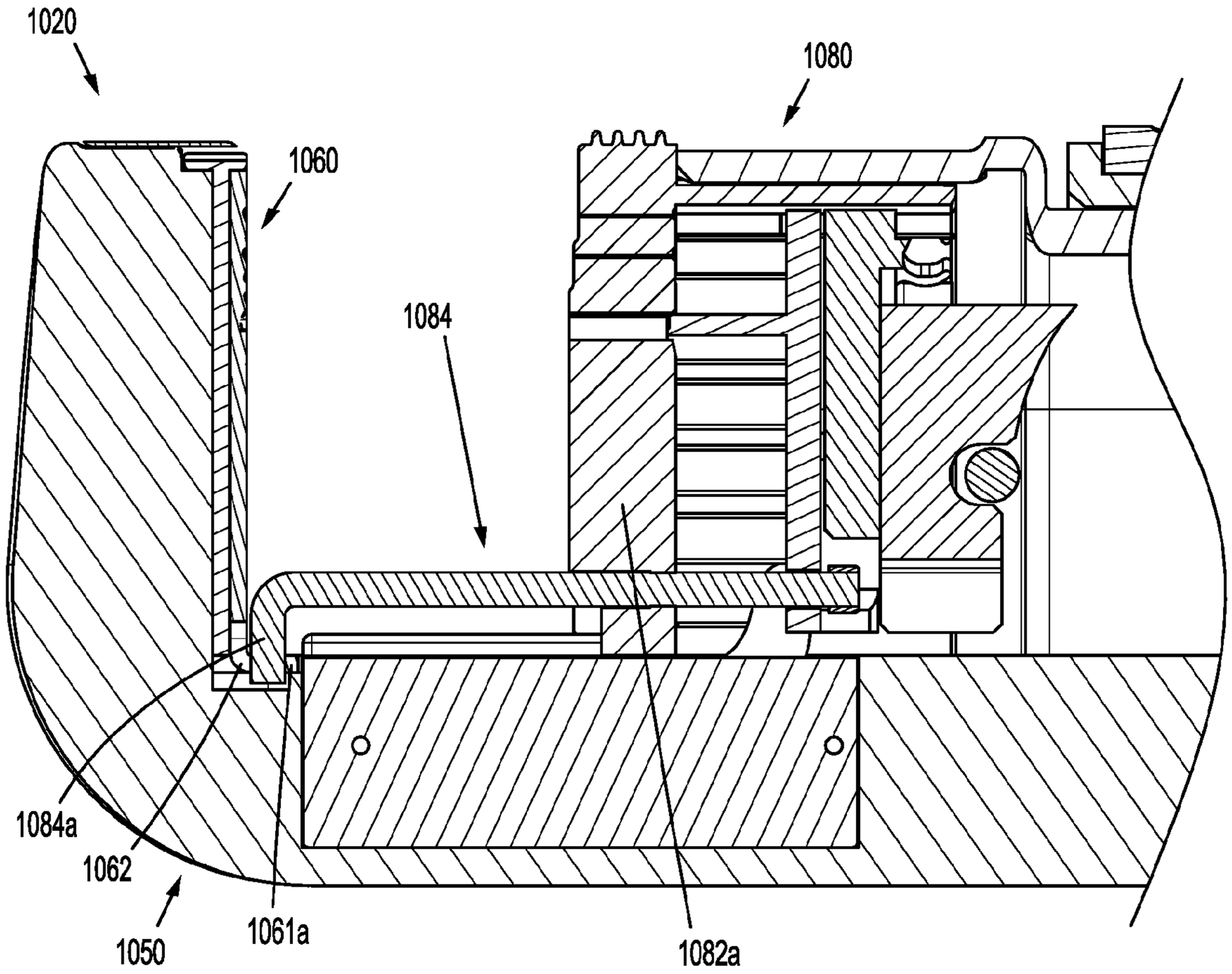


FIG. 38

TISSUE GUIDE FOR CURVED END EFFECTORS

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a National Stage Application of PCT/CN2020/074175 under 35 U.S.C. § 371(a) filed on Feb. 3, 2020, the disclosure of which is incorporated herein by reference in its entirety.

FIELD

The present disclosure relates generally to a surgical instrument and, more specifically, to a surgical stapling instrument for clamping, and joining and/or cutting tissue.

BACKGROUND

Surgical stapling instruments used for applying parallel rows of staples through compressed living tissue are well known in the art, and are commonly used, for example, for closure of tissue or organs during surgical procedures for performing anastomoses and/tissue transection or resection. Surgical stapling instruments are often used for occlusion of organs in thoracic and abdominal procedures. Typically, surgical stapling instruments include an anvil assembly, a cartridge assembly for supporting an array of surgical staples, an approximation mechanism for approximating the anvil and cartridge assemblies, and a firing mechanism for ejecting the surgical staples from the cartridge assembly.

The cartridge assembly may include an alignment pin and a tissue guide for retaining tissue between the cartridge and anvil assemblies and for aligning and maintaining alignment between the cartridge and anvil assemblies during approximation and firing of the surgical stapling instrument.

To ensure alignment of the cartridge and the anvil assemblies, it would be beneficial to have a surgical stapling instrument that includes features that restrict unnecessary movement of the cartridge and anvil assemblies and maintain alignment of the cartridge and anvil assembly during actuation of surgical stapling instrument.

SUMMARY

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a pusher assembly disposed within the base portion of the housing of the end effector. The base portion secured to the distal portion of the elongate body portion and the cartridge assembly including a housing and a tissue guide. The tissue guide being moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly. The pusher assembly is configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the anvil assembly.

In embodiments, the tissue guide includes a feature for engaging the flange.

The present disclosure further relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, and a cartridge assembly releasably supported on the base portion and moveable between a retracted position and an advanced position. The base portion is secured to the distal portion of the elongate body portion. The cartridge assembly includes a tissue contacting surface and a tissue guide extending from the tissue contacting surface. The tissue guide is spaced from the anvil assembly when in the retracted position and is in engagement with the anvil assembly when in the advanced position.

In embodiments, a free end of the tissue guide is sharpened.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide selectively extendable from the cartridge assembly. The base portion is secured to the distal portion of the elongate body portion. The tissue guide is configured to engage the anvil assembly as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

In embodiments, the anvil assembly includes a flange and the tissue guide engages the flange as the cartridge assembly is secured to the base portion.

In addition, the present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide assembly is configured to engage the at least one tab of the base portion as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

In embodiments, the tissue guide assembly includes a tissue guide portion and a base portion. The base portion may define at least one slot for receiving the at least one tab of the base portion. The tissue guide assembly may further include a spring for biasing the tissue guide portion distally relative to the base portion.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The tissue guide assembly includes a first member and a second member. The first member telescopes relative to the second member between retracted and extended positions.

The present disclosure further relates to a surgical stapling instrument comprising an elongate body portion defining a

longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion including at least one tab. The tissue guide assembly includes a tissue guide pivotally secured to the cartridge assembly.

In embodiments, the tissue guide is slidably disposed relative to the cartridge assembly.

Further, the present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide assembly selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide assembly is configured to engage the at least one tab of the base portion as the cartridge assembly is secured to the base portion to cause deployment of the tissue guide.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, and a tissue guide selectively extendable relative to the cartridge assembly. The base portion includes at least one tab. The tissue guide is configured to engage at least one of the anvil assembly or the base portion as the cartridge assembly is secured to the base portion.

In embodiments, the tissue guide includes a snap feature and the base portion defines an opening for receiving the snap feature. The tissue guide may include a bent portion and the base portion may define an opening for receiving the bent portion.

The present disclosure relates to a surgical stapling instrument comprising an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion and an end effector supported on the distal portion of the elongated body portion. The end effector includes a housing having a base portion and a jaw portion, an anvil assembly supported on the jaw portion, a cartridge assembly releasably supported on the base portion, a tissue guide assembly selectively extendable relative to the cartridge assembly, and a clamping member disposed within the housing and moveable between a retracted position and an advanced position. The base portion includes at least one tab. The tissue guide assembly may include a tissue guide and a bushing slidably received about the tissue guide. Movement of the clamping member from the retracted position to the advance position may advance the bushing about the tissue guide.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments of the presently disclosed surgical stapling instrument are disclosed herein with reference to the drawings, wherein:

FIG. **1** is a perspective view a surgical stapling instrument with an end effector including a removable cartridge assembly having tissue guide according to an exemplary embodiment of the present disclosure;

FIG. **2** is an enlarged view of the area of detail indicated in FIG. **1** with the end effector in the open position and a removable cartridge assembly separated from the end effector;

FIG. **3** is a perspective view of an anvil assembly and a tissue guide member of the end effector shown in FIG. **2**;

FIG. **4** is an enlarged side view of the end effector shown in FIG. **2** with the tissue guide member in a partially advanced position;

FIG. **5** is a perspective view of a portion of the end effector shown in FIG. **2** with the tissue guide member in an advanced position;

FIG. **6** is a cross-sectional side view taken along line **6-6** shown in FIG. **5**;

FIG. **7** is a perspective view of an end effector according to another exemplary embodiment of the present disclosure in an open position;

FIG. **8** is an enlarged view of the area of detail indicated in FIG. **7**;

FIG. **9** is a perspective view of an end effector including an anvil assembly and a removable cartridge assembly having a tissue guide member according to another exemplary embodiment of the present disclosure;

FIG. **10** is a perspective view of the anvil assembly and the tissue guide member of the end effector shown in FIG. **9**;

FIG. **11** is a perspective front view of a removable cartridge assembly according to the present disclosure with a tissue guide assembly in a retracted position;

FIG. **12** is a perspective view of a tissue guide assembly of the removable cartridge assembly shown in FIG. **11**;

FIG. **13** is a perspective view of an end effector according to the present disclosure prior to loading of the removable cartridge assembly shown in FIG. **11**;

FIG. **14** is a perspective view of the end effector shown in FIG. **13** in an open position.

FIG. **15** is a perspective view of the end effector shown in FIG. **13** in a closed position;

FIG. **16** is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. **17** is an enlarged view of the area of detail indicated in FIG. **16**;

FIG. **18** is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. **19** is a perspective view of the tissue guide assembly shown in FIG. **18**, with parts separated;

FIG. **20** is a cross-sectional side view of the end effector shown in FIG. **18** with the removable cartridge assembly in an open position;

FIG. **21** is a cross-sectional side view of the end effector shown in FIG. **18** with the removable cartridge assembly in a closed position;

FIG. **22** is a perspective view of an end effector including a removable cartridge assembly having a tissue guide assembly according to another exemplary embodiment of the present disclosure with a tissue guide in an upright position;

FIG. **23** is a perspective view of the end effector shown in FIG. **22** with the tissue guide in a pivoted position;

FIG. **24** is a cross-sectional view taken along line **24-24** shown in FIG. **23**;

FIG. **25** is a cross-sectional view taken along line **25-25** shown in FIG. **24**;

FIG. **26** is a perspective view of an end effector including a removable cartridge assembly and a tissue guide member according to yet another exemplary embodiment of the present disclosure;

FIG. **27** is a cross-sectional side view of the end effector shown in FIG. **26**;

FIG. **28** is a perspective view of the tissue guide member shown in FIG. **26**;

FIG. **29** is a perspective view of a tissue guide assembly according to another exemplary embodiment of the present disclosure;

FIG. **30** is a cross-sectional side view of an end effector including a removable cartridge assembly and the tissue guide assembly shown in FIG. **29**, with the removable cartridge assembly in a partially loaded condition;

FIG. **31** is a cross-sectional side view of the end effector shown in FIG. **29**, with the removable cartridge assembly in a fully loaded condition;

FIG. **32** is a cross-sectional side view of the end effector shown in FIG. **29**, with the tissue guide assembly in an advanced position;

FIG. **33** is a perspective view of a tissue guide assembly and a distal end of a pusher member according to another exemplary embodiment of the present disclosure;

FIG. **34** is a perspective view of an end effector including the tissue guide assembly and pusher member shown in FIG. **33**;

FIG. **35** is a cross-sectional side view taken along line **35-35** shown in FIG. **34**;

FIG. **36** is a perspective view of an end effector including a removable cartridge assembly having a tissue guide according to another exemplary embodiment of the present disclosure;

FIG. **37** is a perspective view of the tissue guide shown in FIG. **36**; and

FIG. **38** is a cross-sectional side view taken along line **38-38** shown in FIG. **36**.

DETAILED DESCRIPTION

Embodiments of the presently disclosed replaceable cartridge assembly for surgical stapling instruments are described in detail with reference to the drawings, wherein like reference numerals designate corresponding elements in each of the several views. In the drawings and the description that follow, the term "proximal" refers to the end of the surgical stapling instrument that is closer to the clinician, whereas the term "distal" refers to the end of the surgical stapling instrument that is farther from the clinician. In addition, the term "clinician" is used generally to refer to medical personnel including doctors, nurses, and support personnel.

It should be appreciated that the instruments described and illustrated herein are configured to fire surgical staples against an anvil surface; however, aspects of the present disclosure are equally applicable with other forms of staples, fasteners, clips, as well as two part fasteners, made of metallic and/or polymeric materials.

Embodiments of the presently disclosed surgical stapling instruments include a curved end effector having a curved anvil assembly and a curved cartridge assembly. It is envisioned that the aspects of the present disclosure may be suitable for use with surgical stapling instruments having linear end effectors.

With initial reference to FIG. **1**, an exemplary embodiment of the presently disclosed surgical stapling instrument is shown generally as stapling instrument **10**. The stapling instrument **10** includes a body **12** defining a stationary handle **14**, a pivotable trigger **16** movable relative to the stationary handle **14**, an elongated central body portion **18** extending from the body **12**, and an end effector **20** disposed on a distal end of the elongated central body portion **18**. The end effector **20** of the stapling instrument **10** includes an anvil assembly **60** and a replaceable cartridge assembly **80**.

A thumb button **12***a* is slidably positioned on each side of the body **12** of the stapling instrument **10**. The thumb buttons **12***a* are movable to manually advance an alignment pin **86** (FIG. **4**) slideably disposed within the replaceable cartridge assembly **80**. A release button **12***b* is positioned on the proximal end of body **12** of the stapling instrument **10** and is depressible to allow the replaceable cartridge assembly **80** to return from an approximated position (not shown) disposed adjacent to the anvil assembly **60** (FIG. **1**) to an open position spaced from the anvil assembly **60**.

The stapling instrument **10** will be described to the extent necessary to fully disclose aspects of the present disclosure. For a detailed description of the internal structure and function of an exemplary surgical stapling instrument, please refer to commonly owned U.S. Pat. No. 6,817,508 ("the '508 patent"), and commonly owned U.S. Pat. App. Pub. No. 2018/0153544 ("the '544 publication"), the contents of which are incorporated by reference herein in their entireties.

With reference to FIGS. **2-6**, the end effector **20** of the stapling instrument **10** (FIG. **1**) includes a frame **50** having a base portion **52** and an L-shaped jaw portion **54** extending from the base portion **52**. The L-shaped jaw portion **54** includes a longitudinal portion **54***a* and a transverse portion **54***b*. The anvil assembly **60** is supported on the transverse portion **54***b* of the jaw portion **54** of the frame assembly **50** and the cartridge assembly **80** is releasably supported within a head portion **32** of clamp slide members **30** within the base portion **52** of the frame assembly **50**.

The base portion **52** and the transverse portion **54***b* of the jaw portion **54** of the frame assembly **50** of the end effector **20** are curved. In embodiments, the base portion **52** and the transverse portion **54***b* of the jaw portion **54** of the frame assembly **50** of the end effector **20** are substantially J-shaped although other curved and linear configurations are also envisioned. In embodiments, the end effector **20** includes a first radius of curvature and a second radius of curvature. The first and second radii of curvature may be increased or decreased to suit a particular procedure and/or to facilitate access to a particular body cavity or location within a body cavity. In some embodiments, the end effector **20** is formed by a plurality of substantially linear sections that are connected to each other to define a curved-like configuration. Each of the anvil assembly **60** and the cartridge assembly **80** include a curved configuration corresponding to the curved configuration of the frame assembly **50** of the end effector **20**.

In embodiments, a pusher assembly **56** (FIG. **6**) is operably disposed within the base portion **52** of the end effector **20**. The pusher assembly **56** includes a pusher pin **56***a*, a pusher member **56***b* mounted on a distal portion of the pusher pin **56***a*, and a spring **56***c* received about the pusher pin **56***a* for biasing the pusher pin **56***a* distally. As described in the '544 publication, the pusher pin **56***a* is maintained in

a retracted position by a lock member (not shown) of an interlock assembly (not shown). Loading of the replaceable cartridge assembly **80** within the frame assembly **50** of the end effector **20** depresses the lock member, thereby releasing the pusher pin **56***a*. As described below, the pusher member **56***b* on the pusher pin **56***a* engages a tissue guide **84**, causing advancement of the tissue guide **84** into engagement with the anvil assembly **60**.

The head portions **32** (FIG. **2**) of the clamp slide members **30** of stapling instrument **10** support the replaceable cartridge assembly **80** and are slidably supported within the base portion **52** of the frame assembly **50** of the end effector **20**. As disclosed in the '544 publication, the clamp slide members **30** advance in response to actuation of the trigger **16** (FIG. **1**) of the stapling instrument **10** (FIG. **1**) to cause advancement of the replaceable cartridge assembly **100** relative to the anvil assembly **60**. The head portions **32** of the clamp slide members **30** define a channel **31** configured to releasably support the replaceable cartridge assembly **80**. For a detailed description of the structure and operation of an exemplary end effector, please refer to the '544 publication.

The cartridge assembly **80** will only be described to the extent necessary to fully disclose the aspects of the present disclosure. For a detailed description of the structure and operation of an exemplary pusher assembly, please refer to the '544 publication.

The replaceable cartridge assembly **80** of the stapling instrument **10** includes a housing **82** having a base portion **82***a* supporting the tissue guide **84** and an alignment pin retaining portion **82***a* supporting an alignment pin **86** (FIG. **4**). The base portion **82***a* defines a plurality of staple receiving pockets **82***a* that support a plurality of staples (not shown). As described above, when the replaceable cartridge assembly **80** is loaded within the frame **50** of the end effector **20**, the pusher assembly **56** is activated to cause a distal advancement of the tissue guide **84** (FIG. **6**). As disclosed in the '544 publication, prior to or during actuation of the stapling instrument **10**, the alignment pin **86** (FIG. **4**) is advanced into the anvil assembly **60** to capture tissue between the anvil assembly **60** and the replaceable cartridge assembly **80**. The tissue guide **84** and the alignment pin **86** operate together to facilitate and maintain alignment of the replaceable cartridge assembly **80** with the anvil assembly **60** during actuation of the stapling instrument **10**.

Although shown and described as including the pusher assembly **56** (FIG. **6**), it is envisioned that the stapling instrument **10** may include alternative means for advancing the tissue guide **84**. For example, an alignment pin deployment member (not shown) configured for deploying the alignment pin **86**, as described in the '544 publication, may be modified to advance the tissue guide **84** simultaneously with the alignment pin **86**.

With particular reference to FIG. **3**, the tissue guide **84** of the replaceable cartridge assembly **80** includes a proximal engagement portion **84***a*, a distal head portion **84***b*, and an elongate body portion **84***c* extending between the proximal engagement portion **84***a* and the distal head portion **84***b*. A longitudinal groove **85***a* extends the length of the tissue guide **84** for maintaining the rotational orientation of the tissue guide **84** relative to the replaceable cartridge assembly **80** during actuation of the stapling instrument **10**. A notch **85***b* is disposed between the distal head portion **84***b* and the elongate body portion **84***c*. The notch **85***b* accommodates an L-shaped protrusion **62** extending from the anvil assembly **60**. As described below, the L-shaped protrusion **62** releasably retains the tissue guide **84** in an extended position (FIG. **6**). In embodiments, the distal head portion **84***b* includes tapered first and second ends **87***a*. **87***b* to facilitate engagement and disengagement, respectively, of the distal head portion **84***b* of the tissue guide **84** with the L-shaped protrusion **62** of the anvil assembly **60**. In some embodiments, and as shown, the L-shaped protrusion **62** may define a notch or cutout **63** to facilitate engagement of the distal head portion **84***b* of the tissue guide **84** with the L-shaped protrusion **62**.

With reference to FIGS. **7** and **8**, in an alternative embodiment of the present disclosure, a replaceable cartridge assembly **180** includes a tissue guide **184**. The replaceable cartridge assembly **180** is substantially similar to the replaceable cartridge assembly **80** described hereinabove, and therefore will only be described in detail as relates to the differences therebetween.

The tissue guide **184** of the replaceable cartridge assembly **180** extends distally from a base portion **182***a* of a housing **182** of the replaceable cartridge assembly **180** is fixed to the base portion **182***a*. The tissue guide **184** includes a tissue piercing tip **184***a*. During operation of the stapling instrument **10** (FIG. **1**), the tissue guide **184** is configured to pierce tissue (not shown) retained between the replaceable cartridge assembly **180** and the anvil assembly **60**. Engagement of the tissue guide **184** with the anvil assembly **160** during approximation of the replaceable cartridge assembly **180** and the anvil assembly **160** facilitates alignment of the replaceable cartridge assembly **180** with the anvil assembly **160**.

Referring now to FIGS. **9** and **10**, in another embodiment of the present disclosure, a replaceable cartridge assembly **280** includes a tissue guide **284**. The replaceable cartridge assembly **280** is substantially similar to the replaceable cartridge assembly **180** described hereinabove, and therefore will only be described in detail as relates to the differences therebetween.

The tissue guide **284** of the replaceable cartridge assembly **280** includes a notch **285**. The notch **285** is configured to receive a portion of an L-shaped projection **262** extending from an anvil assembly **260** to releasable retain the tissue guide **284** in an extended position (FIG. **9**). The tissue guide **284** is configured such that during initial loading of the replaceable cartridge assembly **280** within the frame **50** (FIG. **9**) of the end effector **20**, the tissue guide **284** engages the L-shaped projection **262**. As the replaceable cartridge assembly **280** is moved to a fully loaded position within the frame **50** (FIG. **1**), i.e., slid proximally towards the body **12** (FIG. **1**) of the stapling instrument **10**, the tissue guide **284** extends from the body portion **282***a* of the replaceable cartridge assembly **280** to maintain engagement with the L-shaped projection **262** of the anvil assembly **260**.

With reference now to FIGS. **11-15**, in another embodiment of the present disclosure, an end effector **320** (FIG. **12**) includes a replaceable cartridge assembly **380** having a tissue guide member **384**. The end effector **320** and the replaceable cartridge assembly **380** are substantially similar to the end effector and the replaceable cartridge assemblies described hereinabove, and will only be described in detail as relates to the differences therebetween.

The tissue guide member **384** of the replaceable cartridge assembly **380** includes a tissue guide portion **384***a* and a base portion **384***b*. The tissue guide portion **384***a* extends parallel to the base portion **384***b* and may be integrally formed, as shown, or may be formed separately and secured together in any suitable manner. The tissue guide member **384** is slidable secured to a base portion **382***a* of the replaceable cartridge assembly **380**. The base portion **384***b*

of the tissue guide member **384** defines a pair of opposed cutouts **385** (FIG. **13**) configured to receive a pair of opposed tabs **355** formed on a transverse portion **354***b* of a jaw portion **354** of a frame assembly **350** of the end effector **320**.

With particular reference to FIG. **13**, when the replaceable cartridge assembly **380** is partially loaded into the frame assembly **350** of the end effector **320**, the opposed tabs **355** on the transverse portion of the jaw portion **354** of the end effector **320** are received within the opposed cutouts **385** in the base portion **384***b* of the tissue guide member **384**.

As the replaceable cartridge assembly **380** is slid into the fully loaded position (FIG. **14**), in the direction indicated by arrow "B" shown in FIG. **14**, the tissue guide member **384** of the replaceable cartridge assembly **380** remains fixed relative to the transverse portion **354***b* of a jaw portion **354** of a frame assembly **350** of the end effector **320**.

With particular reference to FIG. **15**, during approximation of the replaceable cartridge assembly **380** relative to an anvil assembly **360** in the direction indicated by arrow "C" as the stapling instrument **10** is actuated, the tissue guide member **384** facilitates and maintains alignment of the replaceable cartridge assembly **380** relative to the anvil assembly **360**.

With reference to FIGS. **16** and **17**, in an alternative embodiment, a tissue guide assembly **484** includes a tissue guide member **484***a* that is separate or movable from a base **484***b*. A spring **484***c* received about a proximal portion of the tissue guide member **484***a* facilitates advancement of the tissue guide member **484***a* into engagement with an anvil assembly **460**. More particularly, the tissue guide member **484***a* includes proximal and distal flanges **485***a*. **485***b* (FIG. **17**). The spring **484***c* is disposed about the tissue guide **484***a* between the proximal and distal flanges **485***a*. **485***b*. The tissue guide member **484***a* is retained in a retracted position (not shown) by the base portion **482***a* of the replaceable cartridge assembly **480**. When the replaceable cartridge assembly **480** is advanced during approximation of the replaceable cartridge assembly **480** relative to the anvil assembly **460**, the spring **484***c* biases the tissue guide member **484***a* distally into engagement with the anvil assembly **460**.

With reference now to FIGS. **18-21**, in another embodiment of the present disclosure, a replaceable cartridge assembly **580** includes a tissue guide assembly **584**. The tissue guide assembly **584** includes first and second telescoping members **586**, **588**. The first telescoping member **586** includes a proximal portion **586***a* that engages a body portion **582***a* of the replaceable cartridge assembly **580** and the second telescoping member **588** includes a distal portion **588***a* that engages an anvil assembly **560**. The second telescoping member **588** defines a channel **587** (FIG. **19**) through which the proximal portion **586***a* of the first telescoping member **586** is slidably disposed such that the first and second telescoping members **586**, **588** can slide relative to one another during approximation and retraction of the replaceable cartridge assembly **580** relative to the anvil assembly **560**. The tissue guide assembly **584** facilitates and maintains alignment of the replaceable cartridge assembly **580** relative to the anvil assembly **560** during operation of the stapling instrument **10** (FIG. **1**).

With reference to FIGS. **22-25**, in yet another embodiment of the present disclosure, a replaceable cartridge assembly **680** includes a tissue guide member **684**. The tissue guide member **684** is pivotally secured to a body portion **682***a* of the replaceable cartridge assembly **680** by a pivot member **684***a* (FIG. **25**) and is moveable between a vertical position (FIG. **22**) and a horizontal position (FIG. **23**). The tissue guide member **684** is maintained in the vertical position during shipping and loading of the replaceable cartridge assembly **680** by a shipping cap (not shown). Upon loading of the replaceable cartridge assembly **680** within a frame assembly **650** of an end effector **620**, and removal of the shipping cap, the tissue guide member **684** pivots from the vertical position to the horizontal position. In embodiments, the tissue guide member **684** is spring biased.

With particular reference to FIGS. **24** and **25**, the pivot member **684***a* of the tissue guide member **684** is slidably received within a channel **683** in the body portion **682***a* of the replaceable cartridge assembly **680** and is releasably maintained in an advanced position by a bump **683***a* on the body portion **682***a* that extends into the channel **683**. During approximation of the replaceable cartridge assembly **680** relative to an anvil assembly **660**, the force of the pivot member **684***a* of the tissue guide member **684** against the bump **683***a* pushes the pivot member **684***a* over the bump **683***a*, thereby permitting the body portion **682***a* of the replaceable cartridge assembly **680** to advance over the tissue guide member **684** as the replaceable cartridge assembly is advanced to an approximated position (not shown).

Referring to FIGS. **26-28**, in another embodiment of the present disclosure, an end effector **720** includes a replaceable cartridge assembly **780** having a tissue guide member **784**. A distal portion **784***a* of the tissue guide member **784** includes a snap feature **785** for securing the tissue guide member **784** to an anvil assembly **760**. During initial loading of the replaceable cartridge assembly **780** into a frame assembly **750** of the end effector **720**, the snap feature **785** engages the anvil assembly **760** of the end effector **720**. The tissue guide member **784** remains in an extended condition as the replaceable cartridge assembly **780** is slid proximally within the base portion **752** of the frame assembly **750** to its fully-loaded position, and during approximation and actuation of the end effector **720**.

With reference to FIG. **29-32**, in another yet another embodiment of the present disclosure, an end effector **820** (FIG. **30**) includes a pusher assembly **856** for advancing a tissue guide member **884**. The pusher assembly **856** includes a pusher pin **856***a* extending from a pusher base **856***b*, a pusher member **856***c* slidably mounted on about the pusher pin **856***a*, and a biasing member **856***d* (FIG. **29**) received about the pusher pin **856***a* between the pusher member **856***c* and the pusher base **856***b*. The pusher base **856***b* secures the pusher assembly **856** within the base portion **852** of the frame assembly **850**. The pusher member **856***c* is configured to engage the tissue guide member **884** of the replaceable cartridge assembly **880**. The biasing member **856***d* is configured to bias the pusher member **856***c* distally.

With reference to FIG. **30**, during initial loading of the replaceable cartridge assembly **880** within a frame assembly **850** of the end effector **820**, a shipping cap (not shown) retains the tissue guide **884** within a body portion **882***a* of the replaceable cartridge assembly **880**. A proximal end of the tissue guide **884** engages the pusher member **856***c* of the pusher assembly **856**.

Turning to FIG. **31**, as the replaceable cartridge assembly **880** is slid to the fully-loaded position, the tissue guide member **884** pushes the pusher member **856***c* proximally, thereby compressing the biasing member **856***d*.

As shown in FIG. **32**, after the shipping cap (not shown) is removed from the replaceable cartridge assembly **880**, the tissue guide member **884** is advanced by the pusher member

856*c*, which is acted upon by the biasing member **856***d*, into engagement with the anvil assembly **860**.

Referring now to FIGS. **33-35**, in still yet another embodiment of the present disclosure, an end effector **920** includes a replaceable cartridge assembly **980** having a tissue guide assembly **984**. The tissue guide assembly **984** includes a tissue guide member **984***a* and a bushing **984***b* disposed on a proximal end of the tissue guide **984***a*. During initial or partial loading of the replaceable cartridge assembly **980** within a frame assembly **950** of the end effector **920**, the tissue guide member **984***a* is retained within the body portion **982***a* of the replaceable cartridge assembly **980**. As the replaceable cartridge assembly **980** is slid into a fully-loaded position, the bushing **984***b* on the proximal end of the tissue guide **984***a* engages a thrust bar **934** in the end effector **920**, causing the tissue guide **984***a* to advance from within the body portion **982***a* of the replaceable cartridge assembly **980**.

As illustrated in FIG. **35**, during approximation and actuation of the replaceable cartridge assembly **980**, the bushing **984***b* slides along the tissue guide member **984***a*, as indicated by arrow "D".

With reference to FIGS. **36-38**, in yet another embodiment of the present disclosure, a replaceable cartridge assembly **1080** includes a tissue guide member **1084** having a bent distal portion **1084***a*. During initial loading of the replaceable cartridge assembly **1080** within a frame assembly **1050** of the end effector **1020**, the bent distal portion **1084***a* of the tissue guide member **1084** is received within an opening **1061** in a flange **1062** of the anvil assembly **1060**. Alternatively. and/or in addition, the opening may be in the frame assembly **1050** of the end effector **1020**. As the replaceable cartridge assembly **1080** is slid into the fully-loaded position, the tissue guide member **1084** is advanced from a body portion **1082***a* of the replaceable cartridge assembly **1080**.

It will be understood that various modifications may be made to the embodiments disclosed herein. For example, the components of the surgical stapling instrument can be formed of any material suitable for surgical use and having the required strength characteristics. Therefore, the above description should not be construed as limiting, but merely as exemplifications of embodiments. Those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto.

The invention claimed is:

1. A surgical stapling instrument comprising:

an elongate body portion defining a longitudinal axis and having a proximal portion and a distal portion; and

an end effector supported on the distal portion of the elongated body portion, the end effector including:

a frame having a base portion and a jaw portion, the base portion being secured to the distal portion of the elongate body portion;

an anvil assembly supported on the jaw portion, the anvil assembly including an L-shaped protrusion fixedly mounted on an exterior surface of the anvil assembly and that extends proximally from the jaw portion towards the base portion of the frame of the end effector;

a cartridge assembly releasably supported on the base portion, the cartridge assembly including a housing and a tissue guide, the tissue guide moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly; and

a pusher assembly disposed within the base portion of the frame of the end effector, the pusher assembly being configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the L-shaped protrusion of the anvil assembly to releasably retain the tissue guide in the advanced position.

2. The surgical stapling instrument of claim **1**, wherein the tissue guide includes a tapered distal end surface.

3. The surgical stapling instrument of claim **1**, wherein the tissue guide includes a notch that receives a portion of the L-shaped protrusion of the anvil assembly.

4. The surgical stapling instrument of claim **1**, wherein the cartridge assembly further includes an alignment pin disposed within the housing of the cartridge assembly and moveable from a retracted position to an advanced position relative to the housing.

5. The surgical stapling instrument of claim **1**, wherein the housing of the cartridge assembly defines a plurality of staple receiving pockets.

6. The surgical stapling instrument of claim **1**, wherein the tissue guide includes a feature for maintaining a rotational orientation of the tissue guide relative to the housing of the cartridge assembly.

7. The surgical stapling instrument of claim **1**, wherein the tissue guide has a length and defines a longitudinal groove extending along the length of the tissue guide.

8. An end effector for a surgical stapling instrument, the end effector comprising:

a frame having a base portion and a jaw portion, the base portion configured to be secured to an elongate body portion of the surgical stapling instrument;

an anvil assembly supported on the jaw portion, the anvil assembly including an L-shaped protrusion fixedly mounted on an exterior surface of the anvil assembly and that extends proximally from the jaw portion towards the base portion of the frame of the end effector;

a cartridge assembly releasably supported on the base portion, the cartridge assembly including a housing and a tissue guide, the tissue guide moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly such that the tissue guide engages the L-shaped protrusion of the anvil assembly to releasably retain the tissue guide in the advanced position; and

a pusher assembly disposed within the base portion, the pusher assembly being configured to move the tissue guide from the retracted position to the advanced position such that the tissue guide engages the anvil assembly.

9. The end effector of claim **8**, wherein the tissue guide includes a tapered distal end surface.

10. The end effector of claim **8**, wherein the L-shaped protrusion of the anvil assembly defines a notch that receives the tissue guide.

11. The end effector of claim **8**, wherein the cartridge assembly further includes an alignment pin disposed within the housing of the cartridge assembly and moveable from a retracted position to an advanced position relative to the housing of the cartridge assembly.

12. The end effector of claim **8**, wherein the housing of the cartridge assembly defines a plurality of staple receiving pockets.

13. The end effector of claim **8**, wherein the tissue guide includes a feature for maintaining a rotational orientation of the tissue guide relative to the housing of the cartridge assembly.

14. The end effector of claim **8**, wherein the tissue guide has a length and defines a longitudinal groove extending along the length of the tissue guide.

* * * * *